THE FARM

SHOWN TO THE CHILDREN

The People's Free Reading Room & Library.

LIBRARY RECORD OF ISSUE.

Pd-16 *Accession No.* 1832

Class No. ~~II~~ *Place No.*

Of-16

9-4-24	9 (425)	5 (1149)
23-4-24	28-7-37	10-4-56
23-10-26	23 (972)	
13-12-1927.	5 - 6 43	
18-2-1928.	3 (1420)	
↓	8-2-44	
7-11-29	54 (659)	
10	14·2·46	
19-3-30	Renewed	
	7 - 3 - 46	
42 (1116)	30 (179)	
5-5-37	29-3-47	

~~Of-16~~
Pd-16

PEOPLE'S FREE R. R. & LIBRARY
BOMBAY.

THE "SHOWN TO THE CHILDREN" SERIES

EDITED BY LOUEY CHISHOLM

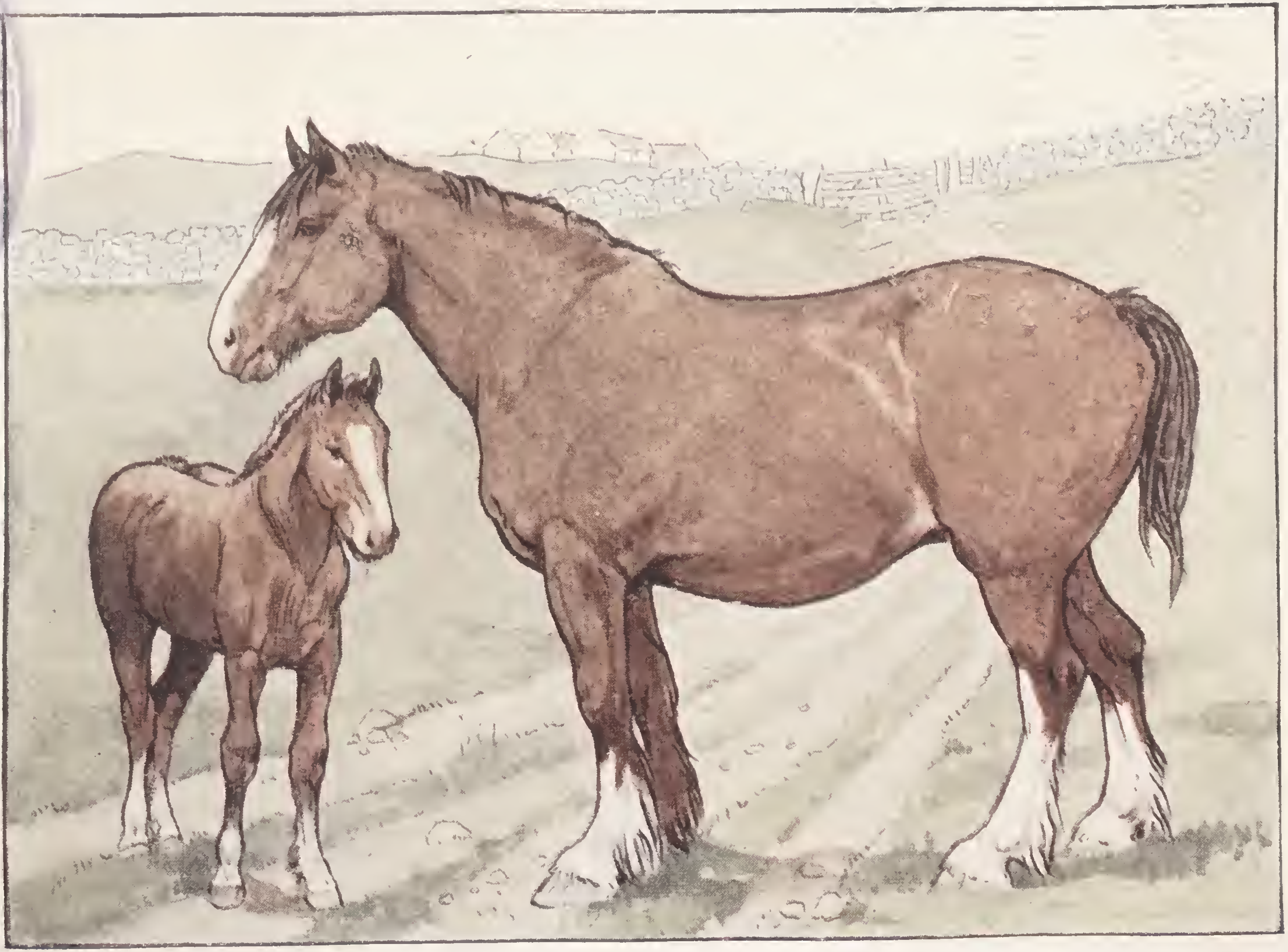
PEOPLE'S FREE R. R. & LIBRARY
BOMBAY.

THE FARM

The
"Shown to the Children" Series

1. BEASTS.
   With 48 Coloured Plates by PERCY J. BILLINGHURST. Letterpress by LENA DALKEITH.
2. FLOWERS.
   With 48 Coloured Plates showing 150 flowers, by JANET HARVEY KELMAN. Letterpress by C. E. SMITH.
3. BIRDS.
   With 48 Coloured Plates by M. K. C. SCOTT. Letterpress by J. A. HENDERSON.
4. THE SEA-SHORE.
   With 48 Coloured Plates by JANET HARVEY KELMAN. Letterpress by Rev. THEODORE WOOD.
5. THE FARM.
   With 48 Coloured Plates by F. M. B. and A. H. BLAIKIE. Letterpress by FOSTER MEADOW.
6. TREES.
   With 32 Coloured Plates by JANET HARVEY KELMAN. Letterpress by C. E. SMITH.
7. NESTS AND EGGS.
   With 48 Coloured Plates by A. H. BLAIKIE. Letterpress by J. A. HENDERSON.
8. BUTTERFLIES AND MOTHS.
   With 48 Coloured Plates by JANET HARVEY KELMAN. Letterpress by Rev. THEODORE WOOD.
9. STARS.
   By ELLISON HAWKS.
10. GARDENS.
    With 32 Coloured Plates by J. H. KELMAN. Letterpress by J. A. HENDERSON.
11. BEES.
    By ELLISON HAWKS. Illustrated in Colour and Black and White.
12. ARCHITECTURE.
    By GLADYS WYNNE. Profusely Illustrated.
13. THE EARTH.
    By ELLISON HAWKS. Profusely Illustrated.
14. THE NAVY.
    By PERCIVAL A. HISLAM. 48 Two-colour Plates.
15. THE ARMY.
    By A. H. ATTERIDGE. 16 Colour and 32 Black Plates.
16. WORK AND WORKERS.
    By ARTHUR O. COOKE. 48 Illustrations.
17. THE MICROSCOPE.
    By ELLISON HAWKS. Illustrated in Colour and Black and White.

PLATE I



CLYDESDALE MARE AND FOAL

BOMBAY.

~~Cf-16~~

The Farm

SHOWN TO THE CHILDREN

BY

F. M. B. AND A. H. BLAIKIE

DESCRIBED BY

FOSTER MEADOW

Pd
16

FORTY-EIGHT COLOURED PICTURES

LONDON & EDINBURGH
T. C. & E. C. JACK

PEOPLE'S FREE R. R. & L.
BOMBAY.

PEOPLE'S FREE READING ROOM & LIBRARY
BOMBAY.

To

ETHEL

PEOPLE'S FREE R. R. & LIBRARY
BOMBAY.

LIST OF PLATES

PLATE I

Clydesdale Mare and Foal

PLATE II

The Smithy

PLATE III

Cow and Calf (Shorthorn Breed)

PLATE IV

Different Breeds of Cattle
  Jersey
  Ayrshire
  Highland
  Aberdeen Angus

PLATE V

Woman Milking

PLATE VI

The Dairy
  1. Refrigerator
  2. Milk-can
  3. Sieve
  4. Milk-plates
  5. Separator
  6. Crock
  7. Churn
  8. Butter Worker
  9. Wooden Tub
  10. Scotch Hands
  11. Thermometer
  12. Milking-pail

PLATE VII

Feeding Calves

PLATE VIII

Leicester Ewe and Lambs

PLATE IX

Four Breeds of Sheep
  1. South Down
  2. Shropshire
  3. Blackfaced
  4. Cheviot

PLATE X

Sheep-Shearing

PLATE XI

Sheep Dipping

PLATE XII

Feeding Store Sheep on Turnips

PLATE XIII

Shepherd and Dog

PLATE XIV

Sow and Young Ones

PLATE XV

Four Breeds of Poultry
  1. Plymouth Rock
  2. Indian Game
  3. Leghorn
  4. Bantam

PLATE XVI

Hen and Chickens

PLATE XVII

Duck and Drake
Goose and Gander

PLATE XVIII

Turkey-Cock
Turkey-Hen
Guinea-Fowl (Cock)
Guinea-Fowl (Hen)

PLATE XIX

Eggs

PLATE XX

Drainers at Work

PLATE XXI

Ploughing

PLATE XXII

Grain Crops
  1. Wheat
  2. Oats
  3. Barley

PLATE XXIII

Sowing by Hand

PLATE XXIV

Broadcast Sower

PLATE XXV

Drill Plough at Work

PLATE XXVI

Chief Varieties of Green-Crop
  1. Potato
  2. Field Carrot
  3 and 4. Mangold Wurzel

PLATE XXVII

1. Common Turnip
2. Swede
3. Turnip with Finger and Toe

PLATE XXVIII

1. Cabbage
2. Young Cabbage
3. Curly Green

PLATE XXIX

Planting Early Potatoes

PLATE XXX

Potato-Digger at Work

PLATE XXXI

Chief Grasses of the Farm
1. Perennial Rye Grass
2. Italian Rye Grass
3. Cocksfoot
4. Timothy

PLATE XXXII

Chief Grasses of the Farm (continued)
1. Meadow Fescue
2. Meadow Foxtail
3. Crested Dogstail

PLATE XXXIII

Chief Grasses of the Farm (continued)
1. White Clover
2. Red Clover
3. Trefoil or Yellow Clover
4. Alsike

PLATE XXXIV

Useless Grasses
1. Common Bent
2. Yorkshire Fog
3. Couch Grass
4. Wild Oat Grass
5. Hair Grass

PLATE XXXV

Weeds
1. Charlock
2. Spurrey
3. Dock
4. Chickweed
5. Coltsfoot

PEOPLE'S FREE R. R. & LIBRARY
BOMBAY.

PLATE XXXVI

Haymaking

PLATE XXXVII

Building a Haystack

PLATE XXXVIII

Different Methods of Harvesting
Man with Scythe
Man with Sickle

PLATE XXXIX

Reaping Machine

PLATE XL

Self-Binder at Work

PLATE XLI

Building Corn Stacks

PLATE XLII

Thatching Stacks

PLATE XLIII

Threshing Mill

PLATE XLIV

Enemies of the Farmer
1. Fox
2. Rabbit
3. Rat
4. Mouse
5. Vole

PLATE XLV

Enemies of the Farmer (continued)
1. Mole
2. Pigeon
3. Crow
4. Sparrow
5. Lesser Black-backed Gull

PLATE XLVI

Enemies of the Farmer (continued)
1. Wireworm
2. Click Beetle
3. Turnip Fly
4. Daddy Long Legs
5. Cleg

PLATE XLVII

Enemies of the Farmer (continued)
1. Sheep Cade
2. Warble Fly
3. Sheep Maggot Fly

PLATE XVLIII

Friends of the Farmer
1. Cat
2. Starling
3. Lapwing
4. Owl
5. Ladybird
6. Worm

PEOPLE'S FREE R. R. & LIBRARY
BOMBAY.

THE FARM

PLATE I

THE HORSE

THE horse first lived in a wild state. How long ago that was no one is able to say; but we do know that for many, many years the horse has been the most useful servant of man.

The farmer could not do the work of a farm without this patient creature's aid. In this country three kinds of horses are used for farming purposes—the Shire horse and the Suffolk, which are English, and the Clydesdale, which is Scotch. They are all strongly built, for the work on a farm is heavy.

The young of a horse is called a foal. Its legs are long for the size of its body. This helps the foal to keep up with its mother when she runs or walks fast.

For two or three years a young horse lives an easy life. Its master does not put it to work until its legs and back have grown strong. It learns what work is bit by bit. A horse needs careful and kind treatment when it begins to work, otherwise it will form habits which will render it of little or no value as a servant.

The food of a horse is suited to its life of hard work. It consists of oats, hay, or straw when at work, and grass in summer time. Crushed oats, split beans and peas, cut hay and straw are mixed together and form a very good food for horses in spring when ploughing and sowing have to be done, and in autumn when the crops are being garnered. A swede, or two or three carrots, thrown into the food is a sweet morsel for the horse. It is wise to vary the food now and then, and this can be done by preparing boiled food of barley and bran, or scalded oats and bran. Whatever food a horse gets is given in three good meals a day—breakfast at half-past five in the morning, dinner at twelve, and supper at six in the evening.

Water should be offered to a horse before it is allowed to eat. If the horse himself is heated by work, not much water should be given. Let the horse first cool, but do not let him stand in a draught. Throw a sack or rug over him as he stands in his stall.

As great care should be taken in the "grooming" of a horse as is taken with the food. Let us look how the grooming is done.

The ploughman takes his stand on the left or "near" side of the horse first, with a brush in his left hand and a comb with short iron teeth, called a curry-comb, in his right. He begins at the head, then he does the neck, the shoulder, and the fore-leg. Next he works over the whole side until he reaches the hind-foot, always combing and brushing in turn. Every now and then you may see him tap the comb against the partition between the stalls to knock out the dust that has gathered with the loose hairs in it. Then he grooms the right, or "off," side in the same way.

After being fed and groomed, the horse is ready for the morning's work, but it cannot go as it is; it must be harnessed.

Let us suppose it is going to draw a load of hay to the market, or from the rickyard to the stable. It must wear cart-harness. First a collar is slipped over its head. It is made to rest as near the shoulders as possible. Next the hames, which are two pieces of wood or iron curved in such a way that they will lie in a groove on each side of the collar, are put on and strapped together at the top. Now the cart-saddle is placed on the horse's back, then the breeching hooked on to it and put over its hind quarters. The saddle is fastened by means of a strong strap which passes under the horse. Lastly the bridle is put on the head and the reins fastened to it. To keep the reins, which are of a good length, from dangling on the ground, they are looped up and hung on one spike of the hames.

The horse is now ready to be yoked to the cart. Strong chains, called draught chains, are first hooked on the hames, the other ends of which—one on each side—are hooked to the cart-shafts. The breeching is hooked to the shafts, and a band passed under the shafts from side to side.

As soon as the horse begins to walk the cart is drawn along. The chains fastened to the collar and the chains on the breeching prevent the horse from getting away from the cart, while the band underneath the shafts prevents them from tipping up.

For drawing a plough and other field implements the harness is much more simple, though somewhat of the same nature. For saddle a stout band of leather is used, and the chains for drawing with are much longer.

The saddle and collar are padded and lined with some soft material. This is done to prevent the horse from being rubbed or chafed.

A horse's age is found out by looking at its teeth. If it is a young horse the fact of having or not having certain teeth will tell how old it is, but if it is more than six years old, it is by the wear of the incisors, or biting teeth, that the age is learnt. A mare has thirty-six teeth and a horse forty. The horse has four tusk-like teeth, two in each jaw, which the mare has not. If the horse's teeth were arranged like ours, we could not put a bit in its mouth, but Nature has left a space, called the bar, between those at the front and those at the back, and it is there the bit rests.

When a farmer wishes to know the height of his horse, he does not measure from head to foot, but from the top of the shoulder to the ground.

One does not speak of feet and inches, however, when measuring a horse, but of "hands." A hand is equal to four inches. Farm horses measure, as a rule, from sixteen to seventeen hands.

Here are six plain rules which are useful to know when you work with horses :—

(1) When you lead a horse, keep it on your right side. Catch the rope close to its head with your right hand and have the loose end in your left.

(2) When you lead a horse on a public road, keep to the right.

(3) If you are leading a horse yoked to a cart, keep to the left, except when you meet a horse being led, when you keep to the right.

(4) Always speak to a horse before you touch it.

(5) Avoid passing close behind a strange horse.

(6) Always be kind, but always be master.

PLATE II

THE SMITHY

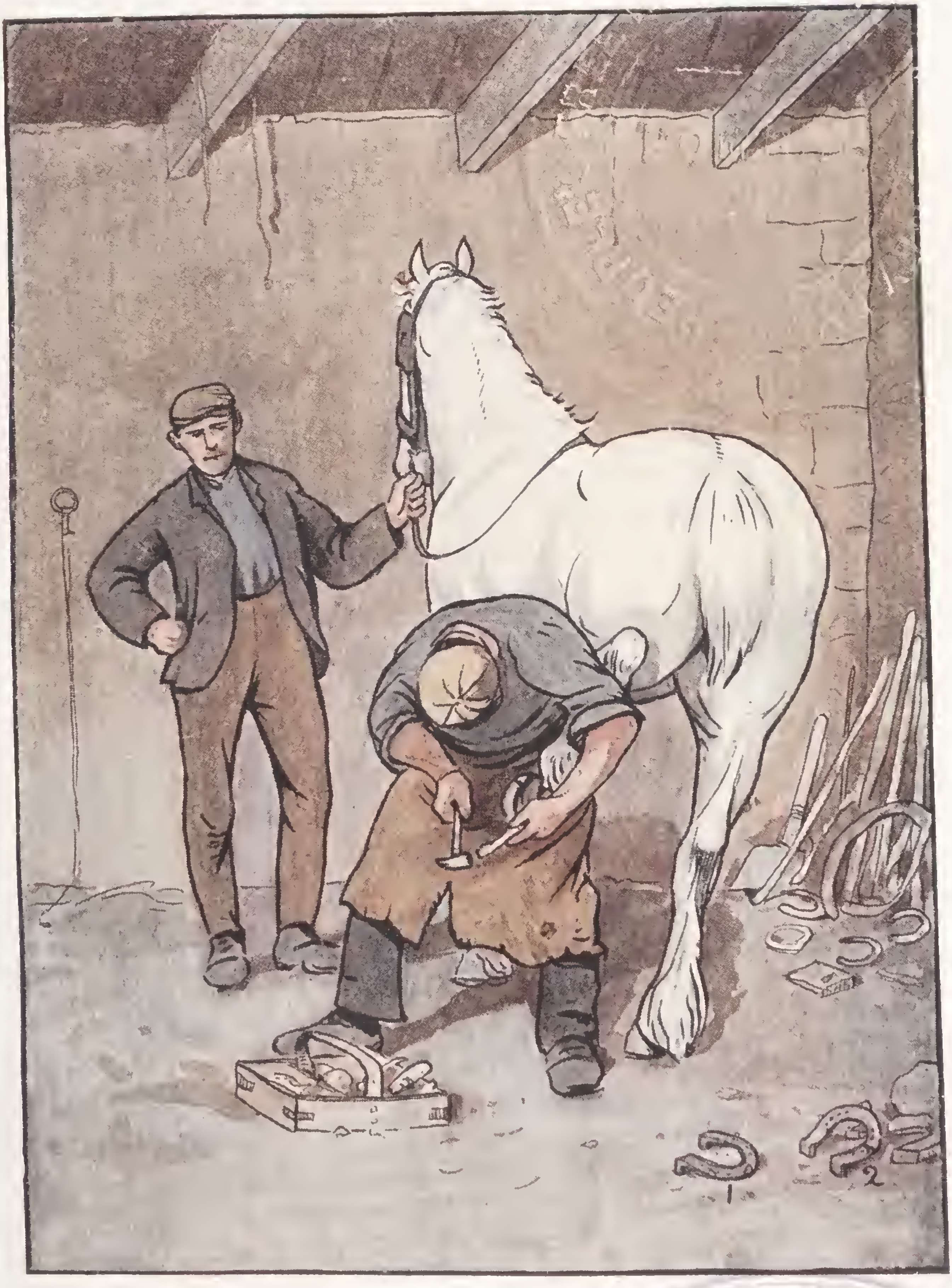
The horse's feet must be shod to prevent the hoof from breaking, and to enable the horse to walk on the hard roads. The hoof is the hard, horny casing of the foot, and takes the place of our toe and finger nails.

Some farms are large enough to have a smithy of their own, but, as a rule, the farmer goes to the nearest village smithy.

The smith, wearing his leather apron, lifts each foot in turn and takes off the old shoe. He draws his tool-box towards him. In it are a paring knife, a hammer, a pair of large pincers, a rasp or file, some shoe-nails, and a tool with which he loosens the old shoe. With the help of the pincers he pulls off the old shoe. With the knife he pares away the hoof which has grown since the horse was last shod. The raised part shaped like a V in the middle of the sole is called the frog. It is the natural cushion on which the horse would walk if it had no shoe.

You may have stood at the open door of the smithy and watched the straight bar of cold iron being made into a horse-shoe, watched it being heated to white heat, then bent and hammered, re-heated, and punched with holes, until at last

PLATE II



THE SMITHY

BOMBAY.

it has its bath of cold water and is rubbed up with a file.

The shoe is at first laid hot against the horse's hoof, so that the smith may see if it presses evenly. He pares the hoof where the hot shoe has burnt it. If the shoe fits, the smith cools it in water and then fastens it to the foot with horseshoe nails. The nails are a little bent at the point, so as to make them turn outwards as they are driven in. If they went into the fleshy part of the foot the horse would be lamed. After the points of the nails which appear in front of the hoof outside are twisted off, they are bent back into the hoof. Thus the shoe is held firmly. A rub with a rasp on the outside edge of the hoof, and the horse is shod.

A hind shoe (1), as you may see in the picture, is more pointed than a fore shoe (2).

In frosty weather a horse going on the roads must have the heels of his shoes sharpened, and toes added, to give the shoes a hold on the slippery ground. To do this the smith takes off the shoes, does to them what is wanted, and re-sets them.

PLATE III

COW AND CALF (SHORTHORN BREED)

There are many different breeds of cattle to be found in the British Isles, each unlike the other in one or more points. One breed is noted for its abundance of milk, another for its richness of milk, and a third because it is easily fattened and makes good beef.

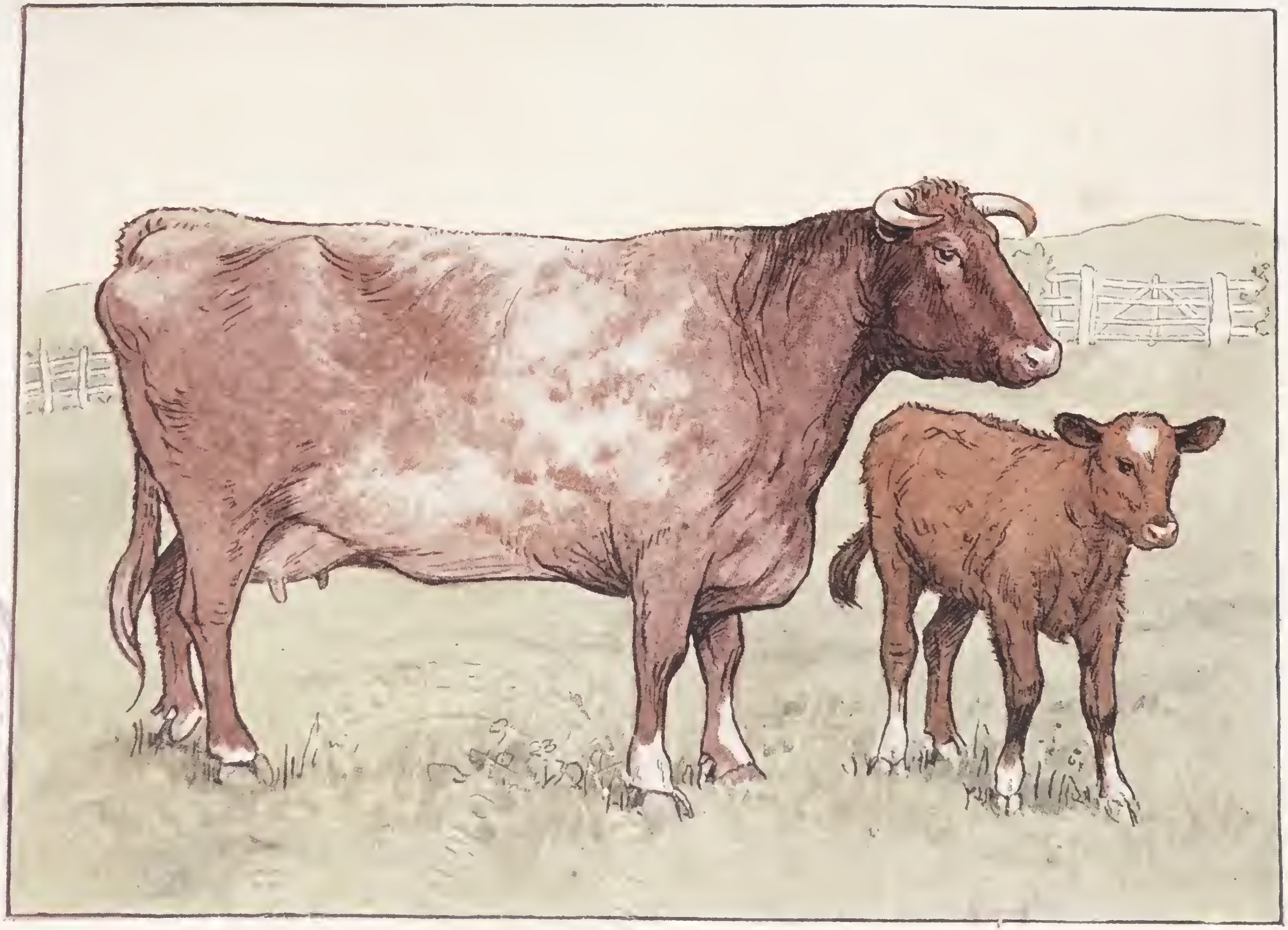
The Shorthorn breed is without doubt the most important. It is more numerous and more widely spread than any of the others. It at first belonged to the north-east of England, but now it is to be seen all over the world, making itself at home everywhere.

The Shorthorn is noted both as a milker and a beef-producer. It is a heavy, big-framed animal, and needs good pasture to show it at its best. The usual colour is roan of varying shades, but reds and whites are common.

In summer-time a cow relies on the grass for her food. When the grass fails, cabbage or tares are given. In winter and spring she is fed on turnips, swedes, and mangold wurzel, and has straw or hay for fodder. On dairy-farms extra food-stuffs are given to increase the quantity of milk, such as bean-meal, bran, draff (the refuse of malt), and dried grains.

There are several interesting differences between horses and cattle. Whereas the horse has only one stomach, and that not a large one, a cow has four stomachs, or, more correctly, has four compartments of different sizes in its stomach. When she is eating she does little more than bite and swallow, but if you go quietly into the byre or stand near her while she is rest-

PLATE III



COW AND CALF

Shorthorn Breed

BOMBAY

ing or standing in the field (Plate V), you will see her with half-shut eyes chewing her food, which comes up in balls from the first compartment, ready, after chewing, to be sent down again to the second. This is called chewing the cud. The horse, on the other hand, gives its food all the chewing it gets before it is swallowed.

The horse has upper and lower front teeth, but the cow has a bare pad of flesh instead of upper front teeth. She twists her tongue round the grass as she bites it.

When horses rise from the ground after lying they throw out their fore-legs and raise themselves on their hind-legs. Cattle get up on their hind-legs first and kneel on their fore-legs.

The cow's foot, too, instead of being one round piece of hoof like that of the horse, is split in two. This enables her to walk on soft ground, whereas a horse's foot causes him to stick, as it acts like a boy's sucker.

The age of horned cattle can be told from the fact that a ring is formed on the horn every year, beginning at the third year. In the case of hornless breeds the teeth are taken as a guide.

PLATE IV

DIFFERENT BREEDS OF CATTLE

JERSEY

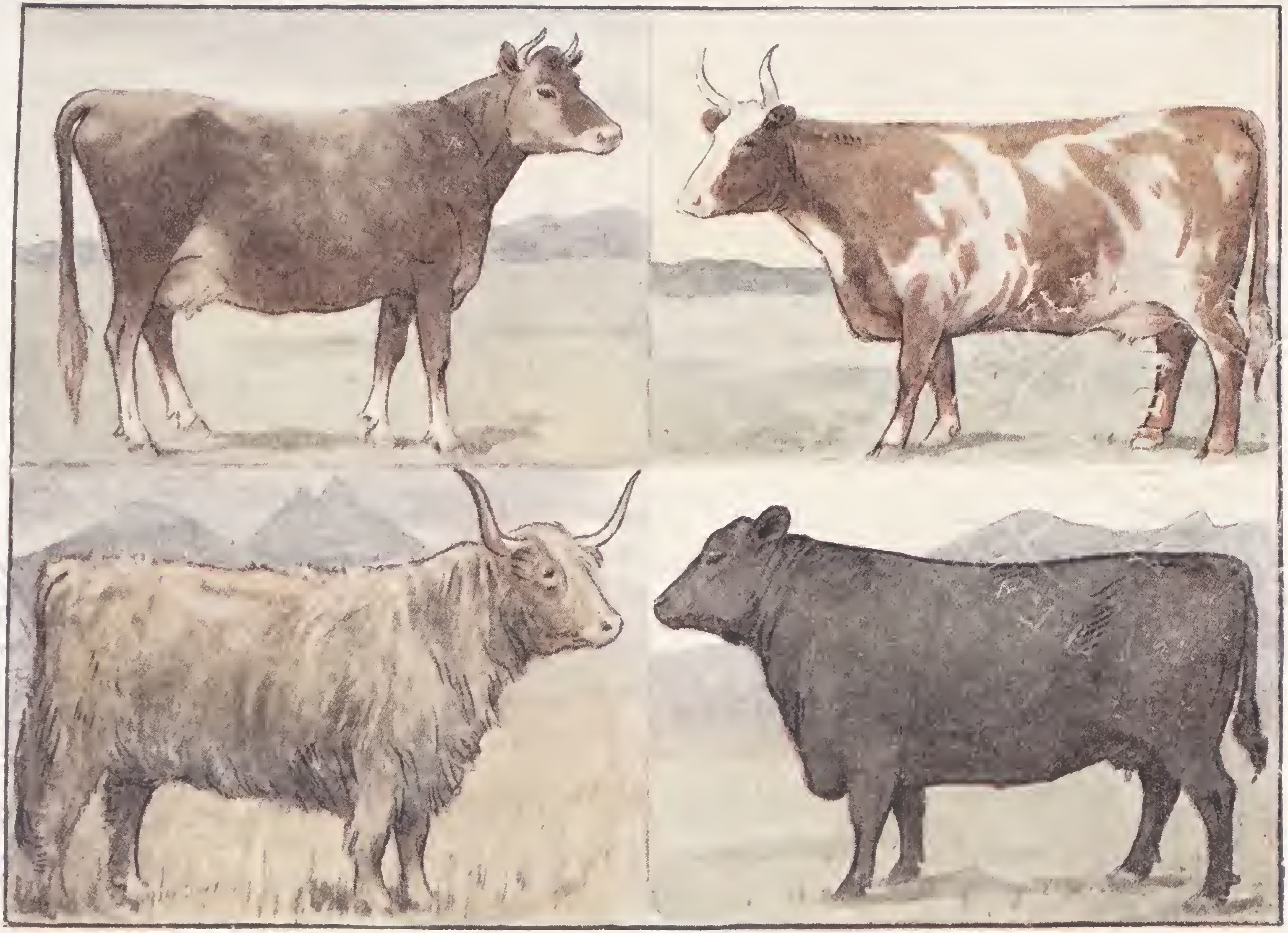
The Jersey cow belongs to one of the prettiest of all breeds of cattle. How dainty, how delicate, how deerlike she is in form and colour! Her home is one of the Channel Islands.

In the neighbouring island of Guernsey is bred a sister breed not unlike the Jersey, only larger and less elegant. A warm climate suits both breeds better than a cold one. Both are famed for the richness of their milk, which makes splendid butter. Whereas it requires from twenty-three to thirty pounds of milk from a shorthorn cow to make one pound of butter, it only requires from fifteen to twenty pounds from a Jersey or a Guernsey cow to make the same quantity.

AYRSHIRE

In the Ayrshire we have the chief dairy breed of Scotland. It is a picturesque sight to watch a well-cared-for herd of these cattle coming out one by one from the byre after milking-time. The distinct white and brown markings, the nicely-turned horns, the alert appearance and

PLATE IV



DIFFERENT BREEDS OF CATTLE

Jersey
Highland

Ayrshire
Aberdeen Angus

PEOPLE'S LIBRARY
BOMBAY.

brisk walk, all combine to please the eye. The absence of fatness and the large well-shaped udder show her to be a bountiful milker.

The Ayrshire is hardy, and easily suits itself to any climate, and to any quality of pasture. The milk is largely used in summer-time for making cheese.

The following are also noted dairy cattle: the South Devon, the Kerry, and the Dexter Kerry—the last two of which are Irish breeds.

HIGHLAND

To see this breed at its best, you must see the cattle in their Highland home—that

> "Land of brown heath and shaggy wood,
> Land of the mountain and the flood."

The cows do not give much milk, but it is rich.

These Highland cattle, or kyloes, as they are sometimes called, are in great demand to adorn the parks of many of "the stately homes of England." Their shaggy coats, which vary in colour from light dun and tawny yellow to black, and their magnificent horns, so widely set and graceful in their curve, combine to make them the most picturesque of British cattle. They fatten slowly, but the beef is famed for its quality.

ABERDEEN ANGUS

The home of the Aberdeen Angus breed, or "Doddies," as they are sometimes called, is in the north-east of Scotland. Their fame, however, as beef-producers is world-wide.

These cattle have glossy black coats and have no horns. They are hardy and good-tempered, and are easily fattened. They grow to a great size, but that is a quality I cannot expect you to admire, for when an animal weighs nearly a ton it is a burden to itself and an object of admiration to feeders and butchers only.

Other noted beef-producers are the Hereford, Devon, Welsh, and Galloway breeds.

PLATE V

WOMAN MILKING

A good milker milks quickly and easily, and gets a frothy "top" on her pail of milk, whereas a poor milker takes longer and possibly works harder, yet can only show "plain" milk.

Good milking makes a cow give her milk freely and plentifully. On the other hand, a cow gives less when she finds herself in the hands of a poor milker. The last milk drawn from the udder is the richest.

PLATE V

WOMAN MILKING

BOMBAY.

In large dairy-farms the cows stand in cow-sheds. In winter-time they stay indoors almost all day, but in summer they come in only to be milked. It is the custom in many places to milk out-of-doors in summer, as is shown in the picture. The milker usually sits to milk on the right side of the cow, to allow the right hand as much freedom as possible.

Good milkers are often very scarce, so milking-machines have been invented. They suck the milk from the cow's udder as a calf does. They have not been altogether successful, however, the chief cause being the difficulty of keeping them clean.

Cleanliness is the secret of success in the management of milk.

Work on a dairy-farm means early hours and constant toil. Therefore when you see the new milk on your breakfast-table, remember with a kindly thought those who have been milking at four or five o'clock in the morning.

PLATE VI

THE DAIRY

When all the cows have been milked, the milk is taken into that part of the farmer's house known as the dairy.

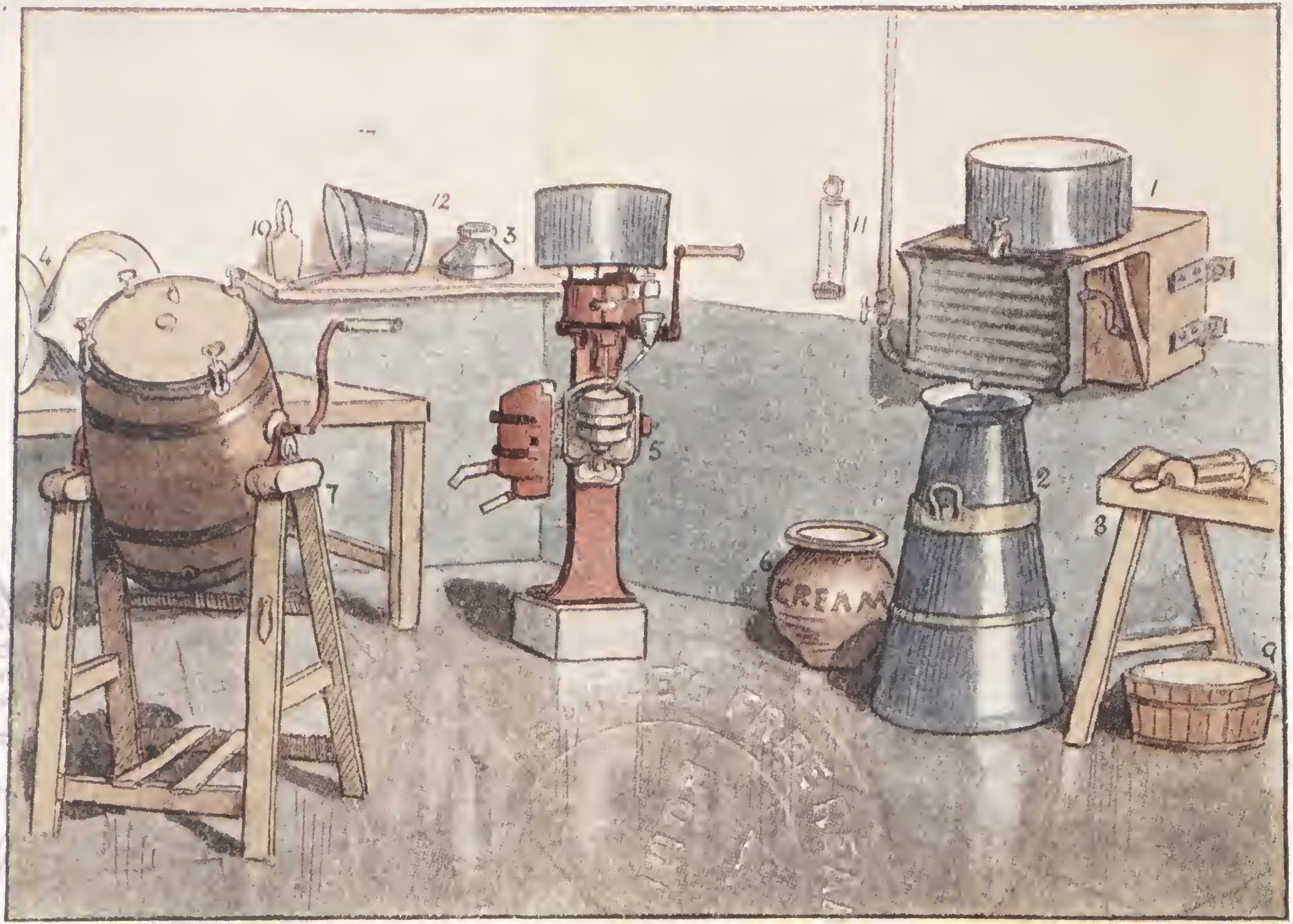
What is going to be done with the milk? It may be used for different purposes. We will try to learn something of these. Come with me into the dairy.

Let us first suppose that the milk is going to be taken to a town to be sold. In this case the farmer will only keep it long enough to pass it over the refrigerator (1)—that box-looking article which is fixed to the wall—for the purpose of cooling it. Through the box there flows a stream of cold water from the pipe which you see coming down the wall. It is that water which cools the milk. It passes over this into the can (2) which you see standing ready to catch it as it flows from the tap just above.

Now suppose that the milk is going to be made into butter. Do you see that machine in the middle of the picture (5), the body of which is painted red, and which has the front part open, that you may look inside? That is called by a hard name from the work it does. The milk, as it is brought into the dairy, is poured into the pan on the top, the handle is turned, and lo! in a few minutes the milk has been separated into two parts—the fatty part, which is called cream, and the non-fatty part, known as separated milk. Hence, the machine is called a Separator. The cream flows out of the separator from the higher pipe, being lighter, and the separated milk from the lower, as it is heavier than the cream. Perhaps you know

PLATE VI

THE DAIRY



1. Refrigerator
2. Milk-can
3. Sieve
4. Milk plates
5. Separator
6. Crock
7. Churn
8. Butter Worker
9. Wooden Tub
10. Scotch Hands
11. Thermometer
12. Milking pail

BOMBAY.

that light liquids will always rise to the top of heavy liquids. That is the way with the cream.

This operation is done every morning and evening as soon as possible after the milking is over. The dairymaid stores the cream till there is enough of it from which to make butter, while the buttermilk that is not needed for baking is carried away to the pigs. The pans (4) on the shelf are milk-pans. Before the machine, of which we have just spoken, was used, the dairymaid would pour the new milk, having first passed it through a sieve (3) into flat pans and let it stay there for twenty-four hours. The cream has by that time risen to the top. The dairymaid skims off the cream, stores it, as we have said before, and sends the skim-milk either to the kitchen or to the calves. The jar or crock (6) is for storing the cream.

What it takes the cream to do in twenty-four hours is done by the separator in a few minutes.

Once or twice a week the butter is made. The cream is poured into that barrel-shaped article (7) which is called a churn. By means of the handle it is turned round. As it goes round you can hear the cream being splashed and dashed inside the churn. If you were churning you would feel the churn becoming heavier after twenty minutes, or at the most thirty-five minutes. Now, stop and take off the end of the churn and look inside. Instead of the thick cream you will see small yellow lumps. That is butter, floating for the present on the buttermilk. The dairymaid will pour that away, and will wash the butter till it is quite free from the milk. Now she takes it up bit by bit by means of two wooden "hands." You may see them there on the shelf (10). With the butter-roller (8) she makes the butter into pieces of a pound each or half-a-pound each. Then as the pieces are finished she lays them in the wooden tub (4).

What else can you see in the dairy? There are only two articles of which we have not spoken. The milk-pail is (12), and (11) is the little instrument, called the thermometer, which is used for finding out the heat of the cream before it is churned, which is most important.

The dairy must be very, very clean and kept as cool as possible.

PLATE VII

FEEDING CALVES

The calf that is suckled by its mother is like the child you may have heard about that is born with a silver spoon in its mouth. It gets all it wants, because it is by birth a prize animal.

Ordinary calves are fed from the first out of a milk-pail. To begin with they need help. The woman who feeds them dips her fingers in

PLATE VII

FEEDING CALVES

BOMBAY.

the pail and keeps them beneath the milk, which the calves drink as they suck her fingers. But they soon learn to drink without that help.

Milk is the most perfect food for the young of either man or beast. It contains all that goes to build up the growing frame of each.

A calf should have three meals a day until it is nine weeks old. From then until it no longer needs milk it is fed morning and night.

The system of feeding is one by which you gradually work the calf out of the milk diet into that of solids, in the form of turnips, hay, and linseed cake.

When new milk is replaced by skim or separated milk, the poor quality of the latter is made up by adding a little linseed or oatmeal porridge, or cod-liver oil.

Young calves should not be pampered or overfed. They should be kept in a well-aired shed with plenty of clean, dry straw, and with freedom to move about. In summer-time they thrive best out in the fields, but they should be housed at night.

PLATE VIII

LEICESTER EWE AND LAMBS

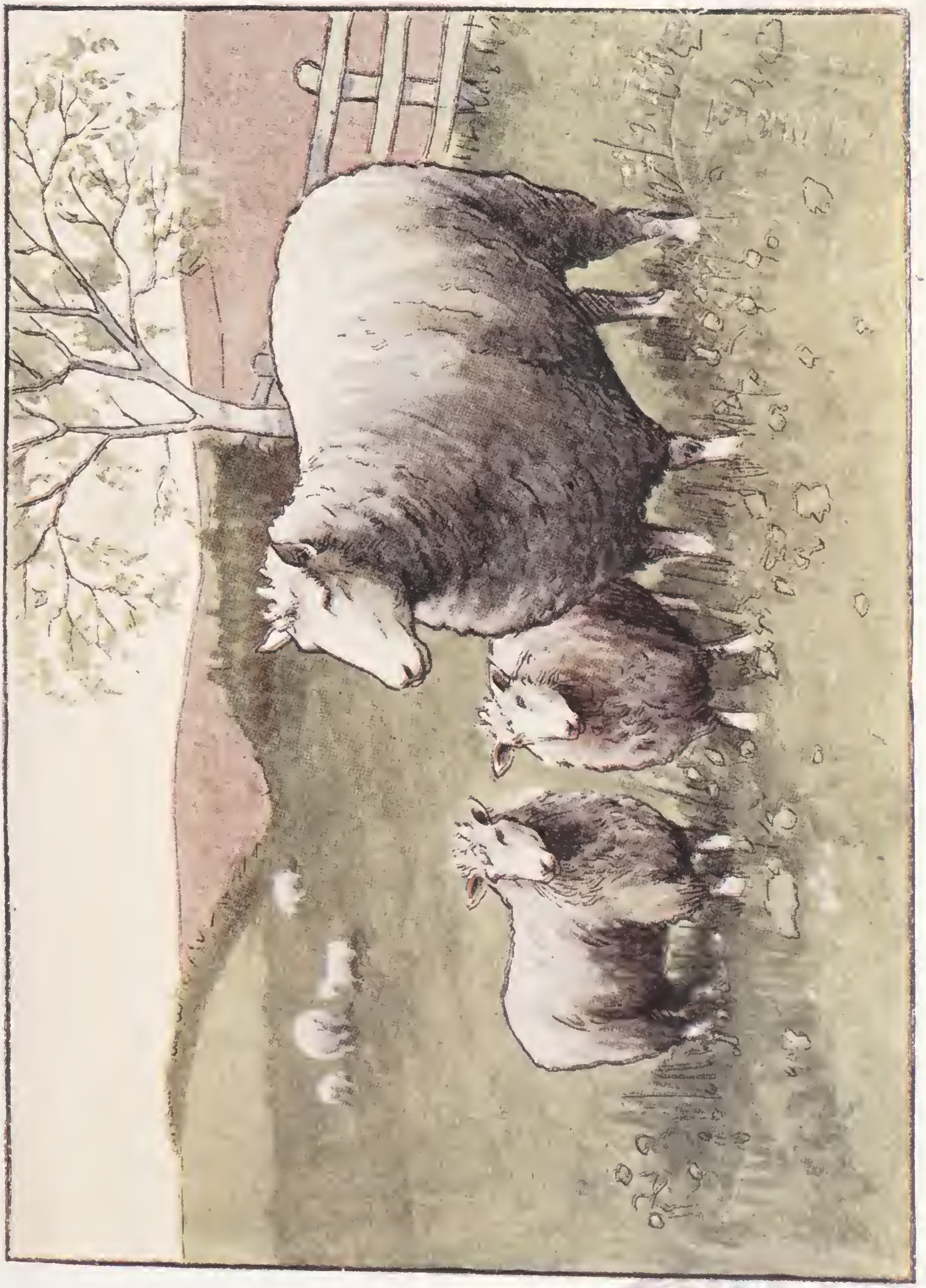
Sheep are to be found on every farm, and there are farms on which they are the chief farm animals. These are called sheep farms.

There the land is not ploughed, but is left in grass. The grass is sometimes scarce and scanty, as on the hill farms of Scotland, or it may be rich and plentiful, as on the Downs of England. As a rule these sheep farms are larger than arable farms, on which the land is ploughed and crops grown.

On lowland farms the lambs begin to appear in the fields in the beginning of March, but it is not till six weeks later that the hill lambs dot the sheltered slopes. It is a very anxious time for the shepherds. They have to see that the little creatures are getting plenty of milk from their mothers. If the ewe dies, then the lamb has to be fed with cow's milk. Sometimes it is given to another ewe that has lost her lamb, but as every ewe knows her own lamb by scent, the skin of the dead lamb is put over the motherless one till the ewe has adopted it. Lowland shepherds like to see twin lambs. We see a ewe with twins in the picture. On the hill farms, however, where the grass is not so abundant, each ewe has, as a rule, a single lamb.

June, July, and August are the months in which the lambs are taken from their mothers. The separation takes place sooner on the lowlands than on the hills. Throughout the country from July to September great lamb sales are held at which most of the lambs are sold, to be fattened for the table on clover, cabbage, and turnips.

PLATE VIII



LEICESTER EWE AND LAMBS

There are twenty-five different breeds of sheep in this country. Three are Scotch, Wales and Ireland claim one each, and the rest are English. These breeds may be divided into Longwool, Shortwool, and Mountain. Sometimes they are divided into Whitefaces and Blackfaces.

The sheep, like the cow, has no upper teeth in front, but has a hard flesh pad instead.

The Leicester is the oldest breed of sheep in England. Most of the other large breeds are related to this one. As you see in the picture, the Leicester is a large, broad-backed sheep. It fattens easily; indeed it is because of its great fatness that the mutton is not much fancied. The breeds that are related to it are greater favourites.

PLATE IX

FOUR BREEDS OF SHEEP

SOUTH DOWN

The South Down is the chief of the short-wooled breeds of sheep. Its early home was on the short, sweet pasturage of the South Downs in Sussex. It is a broad, thick-set little creature with brown face and short brown legs. From forehead to tail it is clothed in a thick coat of short wool. The choiceness of its mutton is its best known quality.

SHROPSHIRE

In appearance the Shropshire looks like a big South Down. Indeed they are distantly related breeds. The face is darker, the head longer and thicker and closely covered with wool on the top. It carries a much heavier fleece. Like the South Down, it yields splendid mutton.

BLACKFACE

This hardy mountain breed has most likely descended from the native Scotch breed. It resembles the Highland cattle, its companion in many a Highland glen, in hardiness, in being able to live on scanty fare and to take care of itself.

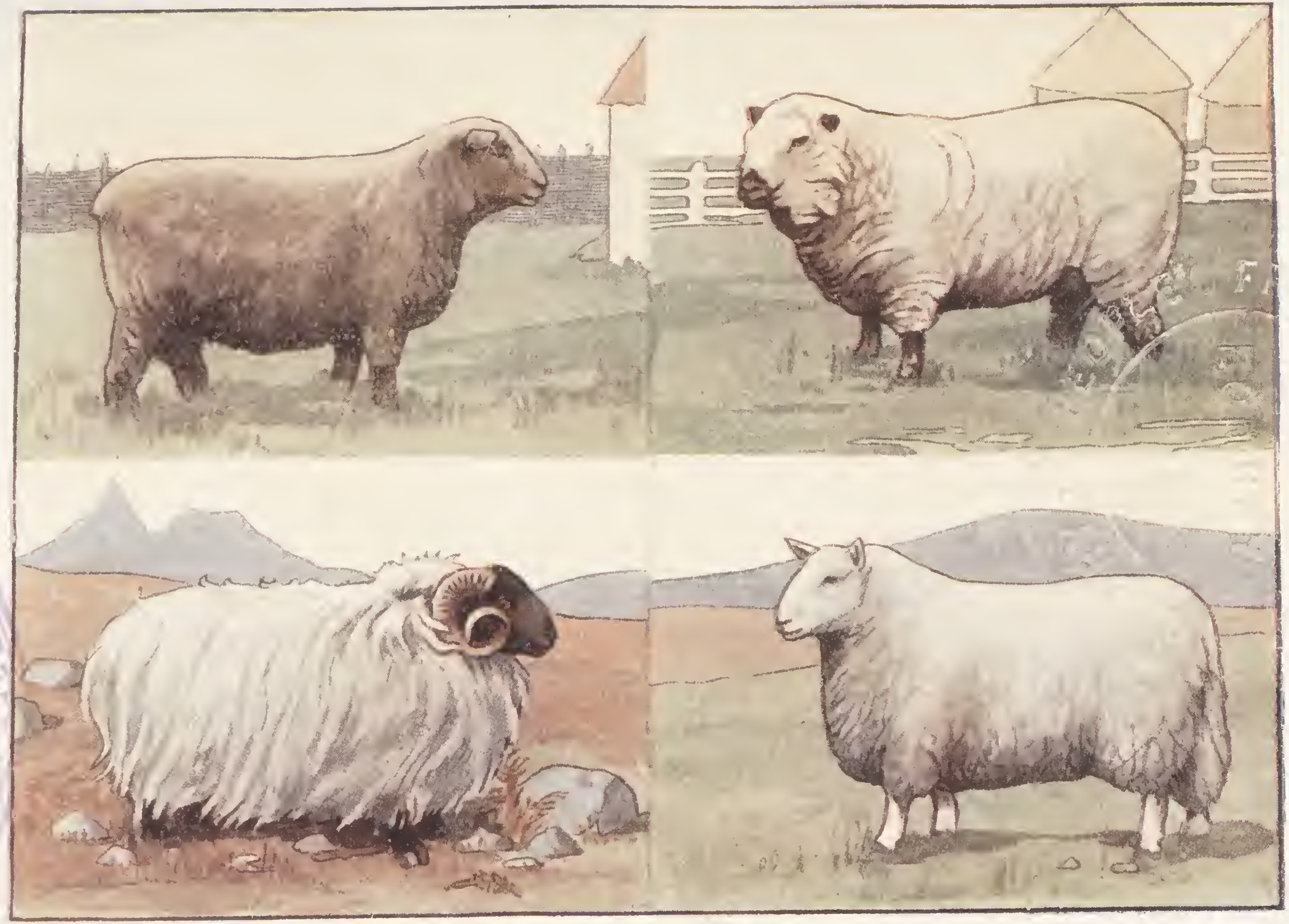
It is now to be found all over Scotland and the north of England. The lambs are in great demand for fattening, as they rival the South Downs in producing choice meat.

The Blackfaces have horns. The ram, or male sheep, is a fine-looking fellow with a Roman nose, massive corkscrew horns, and a thick, strong coat of long wool.

CHEVIOT

The Cheviot sheep take their name from that range of hills called the Cheviots which forms a natural rampart between England and Scotland. Though they are now to be found over a much

PLATE IX



FOUR BREEDS OF SHEEP

1. South Down
2. Shropshire
3. Blackfaced
4. Cheviot

BOMBAY

wider area, the Scottish Border counties are still their chief home.

The Cheviot is white faced, thick-set in the body, clad in close, straight wool, and has short legs. The ram sometimes has horns and sometimes not.

Like the Blackface, this breed is hardy and noted for choice mutton.

The tails of the Cheviot and Blackfaced breeds are not cut short, as is the case with most of the other breeds.

PLATE X

SHEEP-SHEARING

Sheep have two very trying times in their lives: one of them being when they are shorn (Plate X), and the other when they are dipped (Plate XI).

Sheep-shearing takes place between the middle of May and the end of July. The weather is, as a rule, warm, so that the sheep do not much miss the wool that has kept them warm in the winter and spring.

Let us pay a visit to a farm during shearing time. It is a busy scene, and lasts from sunrise to sunset each day till the shearing is done.

The sheep are driven into pens or enclosures made by means of stone walls or hurdles, and then caught one by one. The air is full of noise, lambs bleating for their mothers, ewes bleating for their little ones, and dogs yelping as they assist their masters to collect the flocks.

The picture (Plate X) shows you very clearly how the shearing is done. The shearers, or clippers, take their places near the pens, where the sheep are brought to them one by one. With a strong pair of shears the wool is cut from their backs, while the sheep are held firmly down, their legs having been tied.

Near by is a pot of tar hanging over a fire. A man is there whose duty it is to mark the owner's mark on the sheep's skin when the wool has been cut away.

The wool is rolled up and afterwards packed in wool-sacks ready to be sold.

The number of sheep that can be shorn by one man in a day depends on their size and condition. Roughly speaking, thirty of the larger breeds and sixty of the smaller form a good day's work. Fat sheep are more easily shorn than lean ones, because of an oily substance, called the yolk, which passes from the skin and causes the wool to rise from the skin.

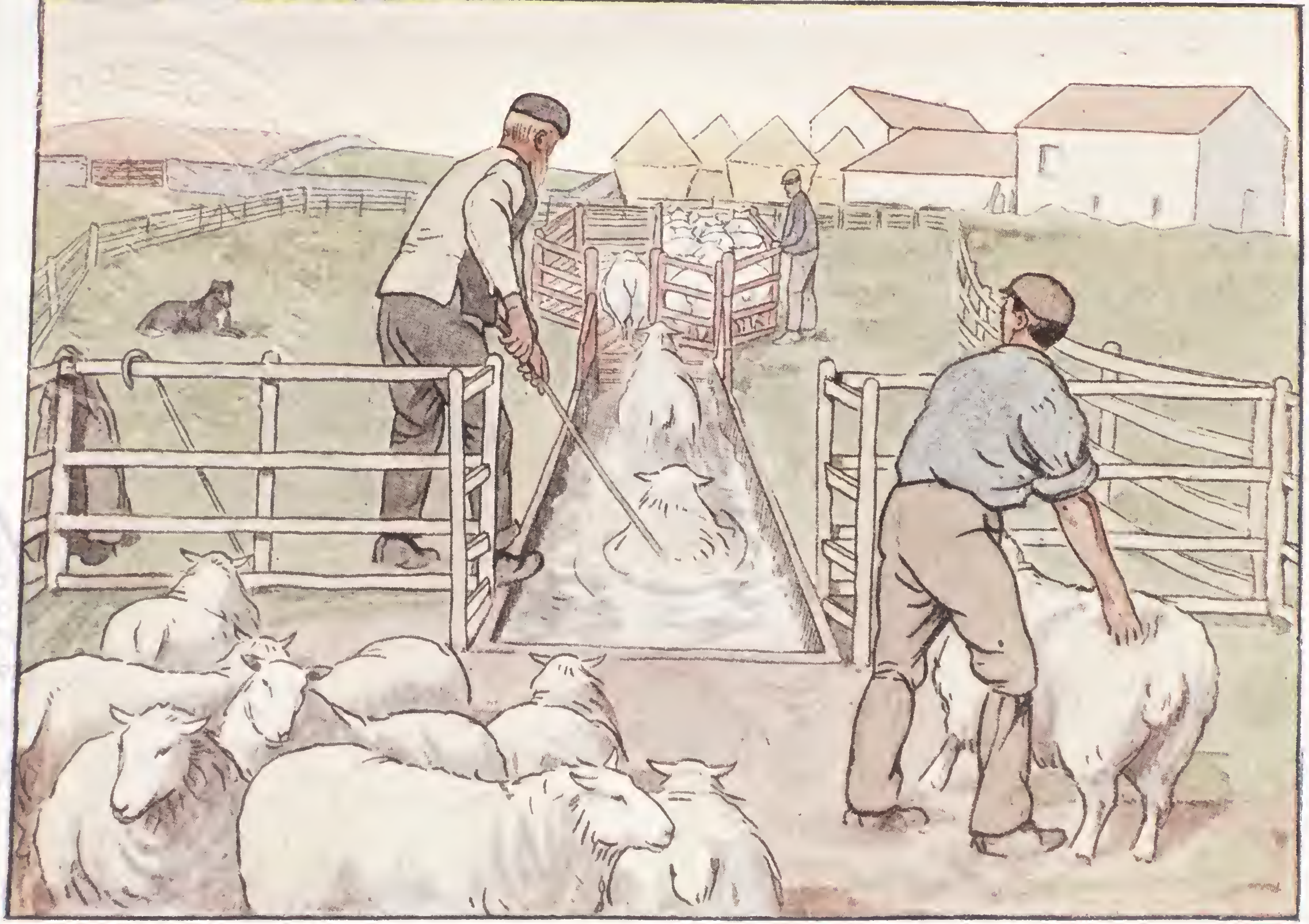
Where many sheep have to be shorn, a machine is used. It clips the sheep more closely than can be done by hand.

Sheep are sometimes made to swim through water ten days before shearing time. This re-

SHEEP-SHEARING

BOMBAY

PLATE XI



SHEEP DIPPING

moves earthy matter from the fleece. Washed wool is worth more than unwashed, but it does not weigh so heavy.

A sheep is not shorn until it is a year old, when it is called a shearling.

PLATE XI

SHEEP-DIPPING

It is one of the laws of the land that sheep must be dipped at least twice a year. The reason of this is that a skin disease, called "scab," may be prevented from spreading from flock to flock. The bath in which the sheep are dipped contains that which will kill the germ of the disease.

The sheep that have to go through the bath are gathered in pens at one end of the dipping trough, which is just wide enough to let one sheep swim straight forward. The bath is about eighteen feet long, and by the time that a sheep has gone from end to end the liquid has soaked right through the wool to the skin. The sheep now steps up an incline into the "dripper," shakes itself, and remains in the dripper for a little while. The liquid drips from the sheep and flows back into the bath. In this way as little as possible is wasted.

On farms where there is no swimming-bath the sheep are caught one by one and dipped into a tank, which contains the same kind of liquid as that in the swimming-bath. It takes three men to do this. One of them stands at the animal's head and closes its ears, so as to prevent the liquid from entering them. The other two seize the sheep by the legs and dip it back-first into the liquid. The sheep is then sent into a dripper.

As the bath contains a harmful liquid, care ought to be taken not to let the sheep go on to their pasture until they are dry.

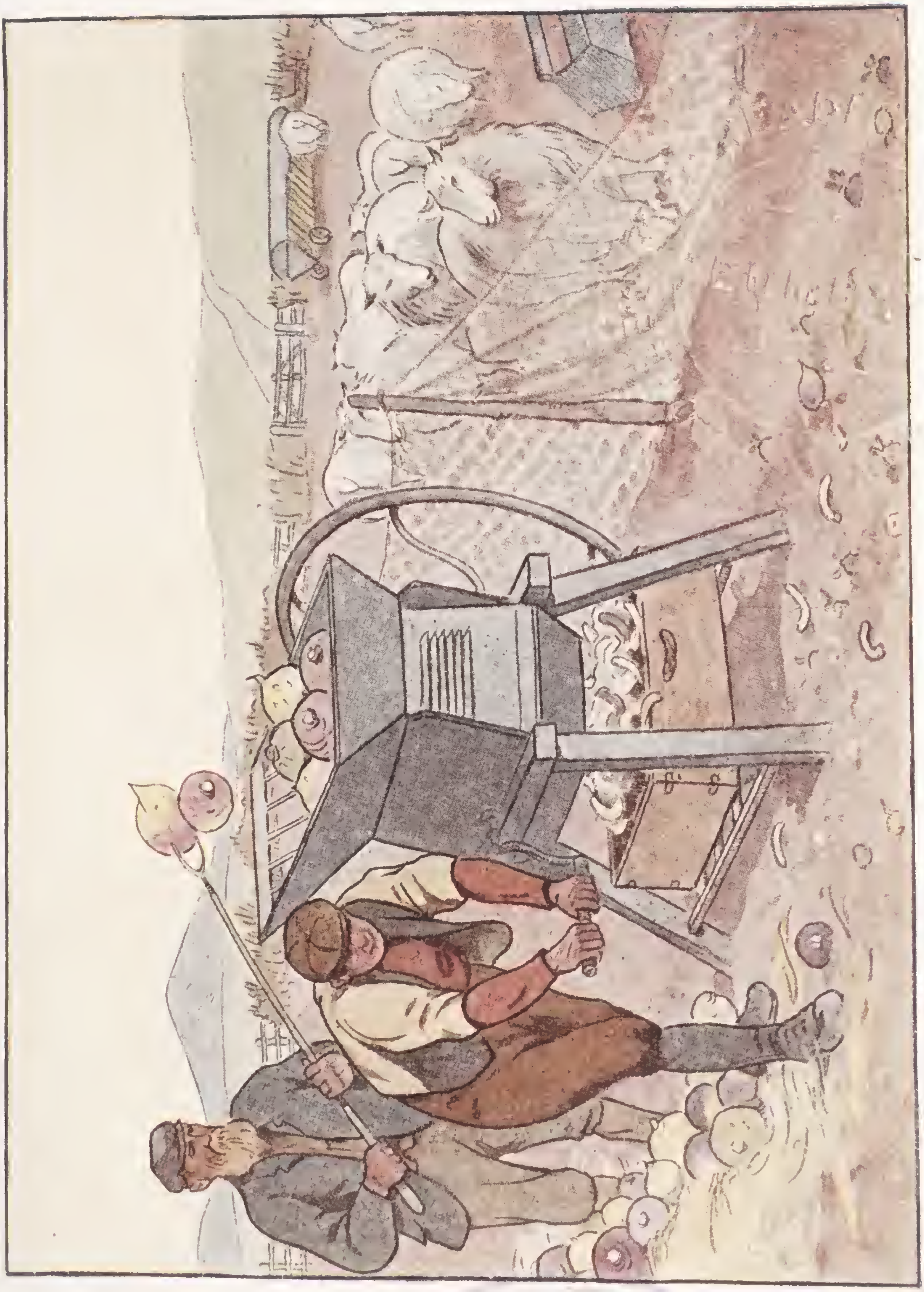
Although dipping is an uncomfortable process for the sheep, they thrive much better after it.

PLATE XII

FEEDING STORE SHEEP ON TURNIPS

Every winter thousands of old and young sheep are fattened to provide food for our tables. These are called store sheep. The largest number of them are fed on yellow turnips and swedes. The yellow turnip, being the softer and therefore unable to stand much frost, is eaten first. The swede is either eaten by the sheep as it grows or it is pulled, topped, and tailed, and then stored in pointed heaps of two or three cartloads. A

PLATE XII



FEEDING STORE SHEEP ON TURNIPS

BOMBAY.

covering first of straw and then of earth is laid on them to keep out the frost. These heaps are kept in rows, so that the sheep may more easily be fed.

Old sheep can eat growing turnips all winter, but young sheep lose their front teeth about New Year time. It is always better to cut turnips for young sheep, and by January it must be done.

The sheep are enclosed within a part of the field by means of wooden hurdles or by wire or rope nets supported by stakes, as in the picture.

The turnip-cutter is placed beside the heap, or pit, as it is usually called. Both are separated from the sheep by the hurdles or net. One man fills the cutter and another turns the handle. The turnips drop out below in the shape of fingers into a box. The cut turnips are then put into long wooden troughs, out of which the sheep eat them. These troughs should be kept clean. In frosty weather, a little salt sprinkled along the bottom of each keeps the turnips from freezing to them. Sheep are fed three times a day, and should never get more turnips than they can eat readily. When the turnips at one pit are finished, the cutter and troughs are moved to the next.

There was a time when sheep got nothing except turnips, but they fattened slowly, as turnips are largely formed of water. In ten pounds of turnips there are almost nine pounds of water. Now-a-days a farmer tries to fatten his sheep as quickly as possible, because the sooner they are ready to sell, the less expense he has. He therefore gives them dry food in the form of oats, broken Indian corn, bran, broken linseed cake, and distillers' grains. He may give two or three of these, or he may give them all mixed together. Hay is also given. It is put in what is called a rack, which keeps it dry and prevents it from being trampled under foot. One is standing near the field gate in the picture.

The feeding of sheep and cattle needs a great deal of thought and care—indeed quite as much as a good cook gives to cooking a nice dinner. When she makes a plum-pudding she uses exact quantities of certain things. It is just the same in feeding sheep or cattle. It is not merely the kind or the amount of food you give them that matters, but the proper quantities of each of the feeding-stuffs that go to make up the mixture.

PLATE XIII

SHEPHERD AND DOG

A clever sheep dog is worth its weight in gold to its master. You must go to a sheep farm to understand how impossible it would be for a shepherd to do without the help of his dog. It

PLATE XIII

SHEPHERD AND DOG

PEOPLE'S FREE R. R. & LIB.
BOMBAY

knows its work so well that when it is on a hillside gathering the sheep together and too far away to hear what the shepherd says, it knows what it has to do by a whistle or a wave of his arm. Each shepherd trains his dog himself, as each has his own way of working.

The dog becomes so like its master that you can tell the kind of man the master is by the way the dog does its work. If it is quick and impatient with the sheep you may be sure its master is quick-tempered.

In England there is the bob-tail sheep dog, and in Scotland there are the short-haired and the long-haired Collies.

PLATE XIV

SOW AND YOUNG ONES

The pig is not at all a handsome creature, but there is no animal that pays the farmer so well. Its food consists chiefly of whey, buttermilk, and food refuse, which would otherwise be thrown away, together with small potatoes and potato-parings. Turnips are also given. On account of the kind of food a pig will eat, it is sometimes called "the poor man's savings bank." In cold weather a pig's food should be made warm.

The sow, or mother pig, has, as a rule, ten or twelve little ones in a litter; and, with care, she will rear two litters in a year. When the little ones are about six weeks old they are taken from their mother's care. They are now able to look after themselves if turned into the field to graze or into the yard to pick up bits of food which may be lying about. They are fond of acorns in the autumn. Soon they thrive and become big.

When a pig is killed, every part of it is useful.

There are six breeds of pigs in this country, of which the best are the large white Yorkshire, the black Berkshire, and the red Tamworth.

The pig is not a dirty animal when it is well taken care of.

PLATE XV

FOUR BREEDS OF POULTRY

Without the cocks and hens the farmyard would be a dull, silent place. Farmers often grumble at them, but there is many a wife or daughter who meets all the household expenses out of the nest-egg that hides below the china hen on the mantel-shelf.

To do well with hens, certain simple rules must be followed. Begin with strong, healthy birds, and keep few rather than too many. They

PLATE XIV

SOW AND YOUNG ONES

PEOPLE'S FREE R. R. LIBRARY
BOMBAY.

will be healthier and lay better. Feed them regularly, but do not overfeed. Give sparingly such food as boiled potatoes, Indian meal, or Indian corn. Give plenty of grit to help them to digest their food, and lime or broken oyster-shells to help them to make their egg-shells. Provide fresh, clean water, and, if possible, give them freedom to go about. Shut them up at night in the hen-house. Keep the house and the nests clean. Do not keep a hen after it is two years old, because it will lay fewer eggs. Replace the old birds either by buying young hens or by setting eggs from healthy stock.

The question as to which of the many different breeds you will have, depends on whether you wish to rear chickens or to sell eggs. The Leghorn breed (3) or the Minorca are good layers, or a hen related to two such breeds as the Black Minorca and the Buff Orpington (Plate XVI). If, however, you wish to rear good table birds, you will select your hens from the Plymouth Rock (1) or the Wyandotte, or have a breed related to either of these and that tall, lanky bird called the Indian Game (2).

The Bantam breed (4) is more pleasing than useful.

Poultry are usually fed twice a day; a meal of cooked food is given in the morning and one of whole oats in the afternoon.

PLATE XVI

HEN AND CHICKENS

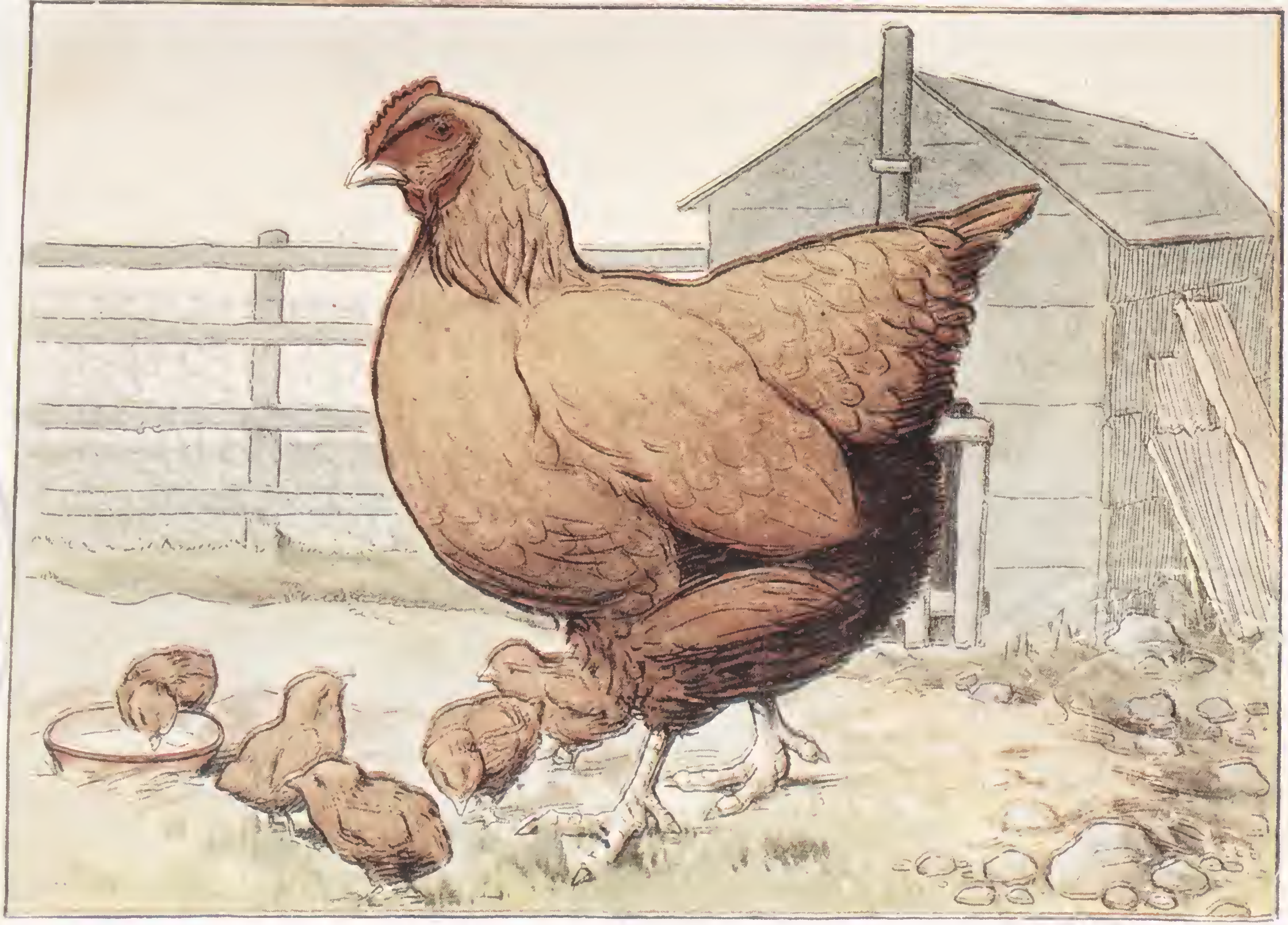
The hen which is shown in the picture with her brood of chickens is a Buff Orpington. This breed makes good mothers. The breeds that lay well do not sit well.

When the farmer's wife finds a hen always sitting in a nest and yet not laying, she knows the hen wishes to hatch chickens. If it is a good time of year, say from March to July, but the earlier the better, she marks thirteen fresh eggs and puts them under the hen.

The hen is put in a coop, so that she may not be disturbed. Every morning she should be lifted off the eggs and placed where she can have a meal of whole oats and fresh water. She must not be off the eggs more than twenty minutes, or else the eggs get cold, which means that the growing chickens inside the shell die. If a hen is not taken off her eggs every day she may continue to sit on them till she is hungry, then she will break the eggs and eat the contents. A hen turns her eggs when she is sitting on them, so that they are evenly heated by her body.

At the end of three weeks the chickens appear. It is seldom that every egg hatches a chicken. One or two may be bad, or the chicken may have

PLATE XVI



HEN AND CHICKENS

BOMBAY

died in the shell. That is why you should never count your chickens before they are hatched.

Two hens are often set at the same time, so that if the eggs hatch poorly the two broods are put under one hen.

The little birds get nothing for the first twenty-four hours of their lives. After that they get a little bread and oatmeal crumbs and a little water in a saucer.

It is wonderful how soon the mites learn to scratch and pick food for themselves. The mother stays with her chickens till she leaves them of her own accord, which may be in eight weeks. It is a good plan to teach the hen to lead her family to the hen-house before she leaves them, for then they know where to go themselves.

A hen mother has different calls which the chickens know at once. There is the call that brings them running to share some tit-bit that she has found, and there is the screech of alarm that sends them in haste under the shelter of her wings.

PLATE XVII

DUCK AND DRAKE

The best-known breed of duck is the Aylesbury. It is white.

The drake has three little curled tail feathers which the duck has not, and the quack of the drake is deeper than that of the duck.

As you know, the duck is more at home on water than on land, therefore it has webbed feet to help it to swim. Ducks do not make good mothers, so ducklings are often hatched under hens.

Thirteen eggs are usually set, and they, as a rule, take twenty-eight days to hatch.

One cannot but feel sorry for the poor hen when in her distress she calls in vain for her family that are busy catching flies on the pond while she dare hardly wet her feet.

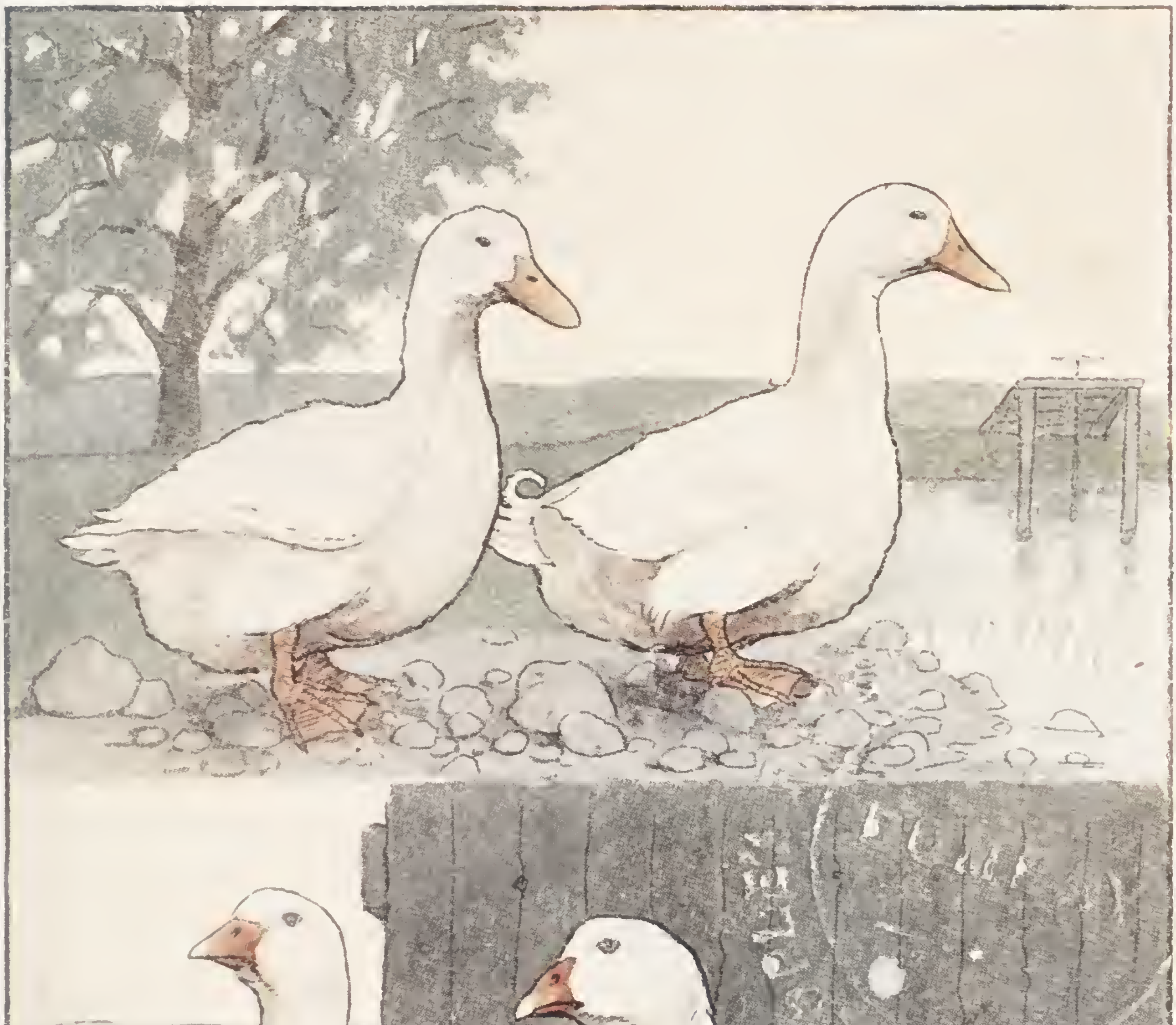
A duck's egg is stronger in taste than a hen's egg.

GOOSE AND GANDER

The gander is very fond of his wife, the goose. While she is sitting on her eleven eggs, he will stand by her nest and guard her from all danger. The goose plucks the down off her breast to line her nest and to keep her eggs warm while she is away feeding or washing herself in the pond. She usually sits thirty days.

At first goslings need care and attention. If their backs get wet they may lose the use of their legs and die. In warm and sunny weather they soon get strong and grow very quickly. Grass is the chief food of the gosling, but as it grows older it is fond of oats.

PLATE XVII



DUCK AND DRAKE
GOOSE AND GANDER

FREE
BOMBAY

PLATE XVIII

TURKEY COCK AND HEN

The turkey cock will attract you by the strange-looking fold of skin over his nose, and by the way he puffs himself out with pride, trails his wings on the ground, and spreads out his tail feathers. The turkey hen is a quiet, gentle bird, and is a good mother. She is given ten or eleven eggs to hatch. She sits patiently for four weeks before she is rewarded for her trouble.

Young turkeys need great care for the first fortnight of their lives, and if the weather be wet, greater care still. During that time their food should consist for the most part of hard-boiled eggs minced very small and mixed with oatmeal and put on a flat plate. Turkeys are very fond of green food, such as dandelions and the leaves of young nettles.

When the watchful mother gives a cry of alarm the young birds hide themselves at once in the long grass or the nearest shelter.

GUINEA-FOWLS

The guinea-fowl is a native of Africa. In many of its ways it still shows its wild nature. It does not mix with other poultry; in fact, because it is a quarrelsome bird, it is not popular in farmyards. On the other hand, it is very hardy, and finds much of its own food, which is chiefly insects. That being so, and because they do not damage crops, farmers have been advised to keep them.

The guinea-hen will lay only in a nest of her own making, and were it not that after laying an egg she utters a long, shrill cry, it would often be difficult to find it. The common farmyard hen is better suited to hatch and rear a brood of young than a guinea-hen is. She does not, like the guinea-hen, tire the little birds by wandering far in search of insects. For this reason a common hen becomes the mother of a brood of guinea-fowls. Twenty is a good hatch. To prevent the little ones from straying, they should be kept for a time in a large wire run or pen.

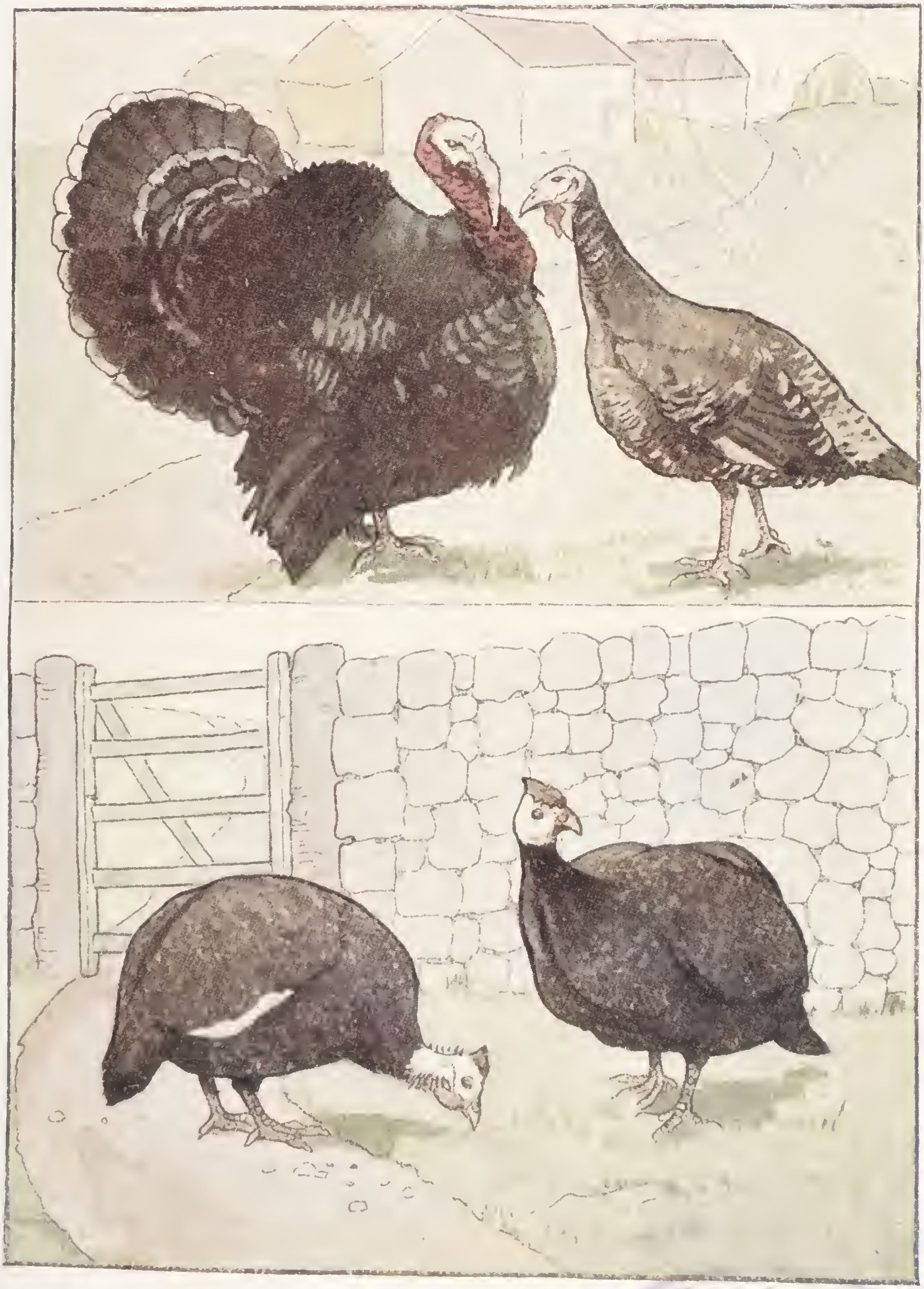
The flesh of this bird is like that of a pheasant, and it is used for the table when game is out of season.

PLATE XIX

EGGS

Here is a picture which shows you the shapes, colours, and markings of the eggs of the different kinds of poultry that have been shown to you. It would be impossible for me to tell you something

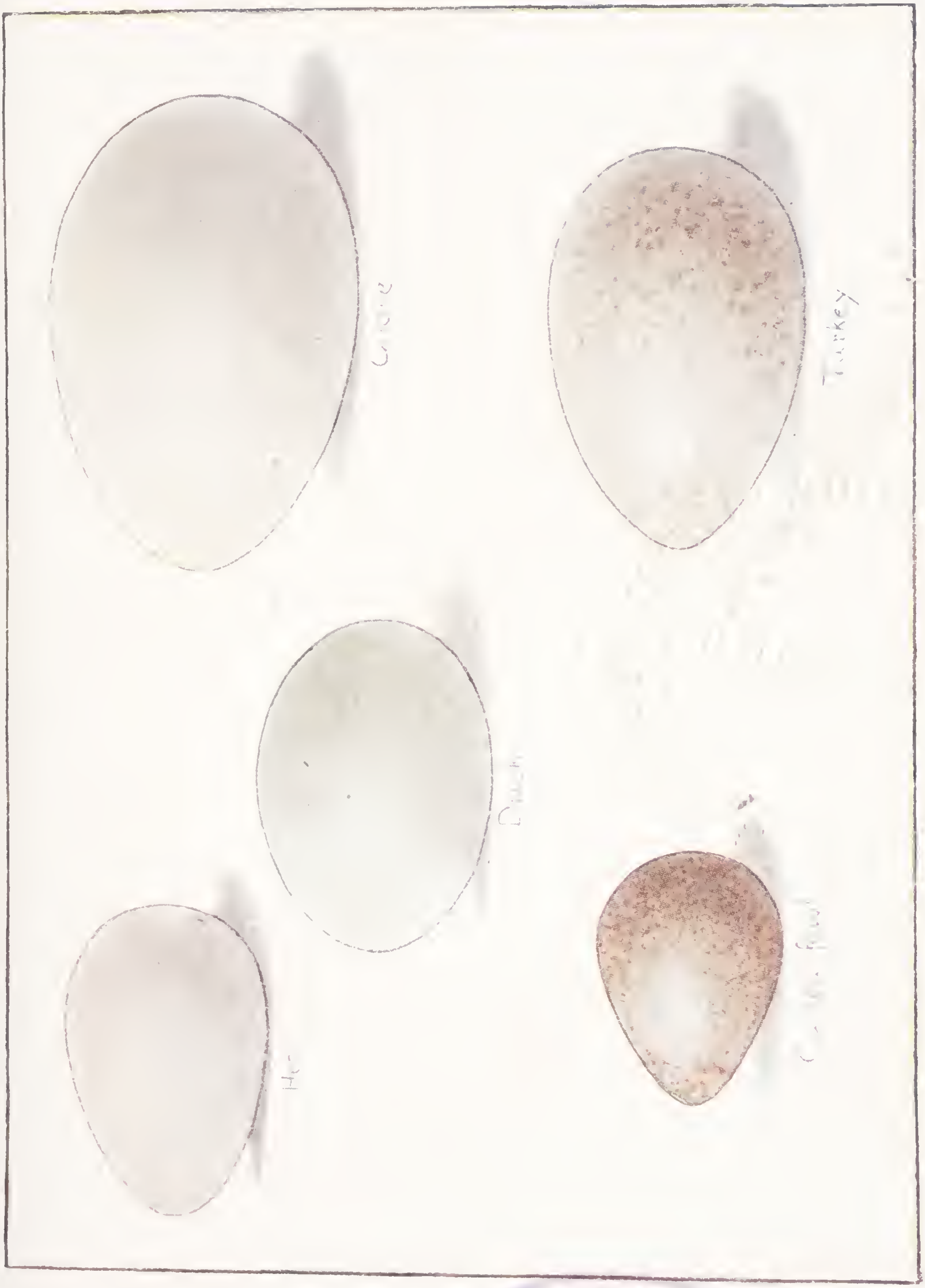
PLATE XVIII



TURKEY-COCK
GUINEA FOWL (Cock)

TURKEY-HEN
GUINEA FOWL (Hen)

BOMBAY.



EGGS

BOMBAY.

about each egg, but I shall give you one or two facts about an egg apart from the bird that laid it.

An egg consists of the shell, the white, and the yolk. At the large end of an egg is a small air space which you may have noticed when you opened one at breakfast. This little cell contains a supply of air for the young chicken before it breaks its way through the shell.

For hatching purposes eggs must be quite fresh. In cool weather an egg will keep fresh for some time, but not in very hot weather. Frost renders it useless for hatching.

PLATE XX

DRAINERS AT WORK

A drainer is a man who lays drains. If the fields were not drained the farmer could not grow his crops with success. The drains carry away the rain-water that soaks into the soil, thus making it not only drier but warmer, and more healthy for plant-life and farm animals. In new countries the benefit of draining is marked by improvement in the climate and in the health of the people.

A field needs draining if it is always wet, or if rushes or coltsfoot or other weeds that like moisture grow on it.

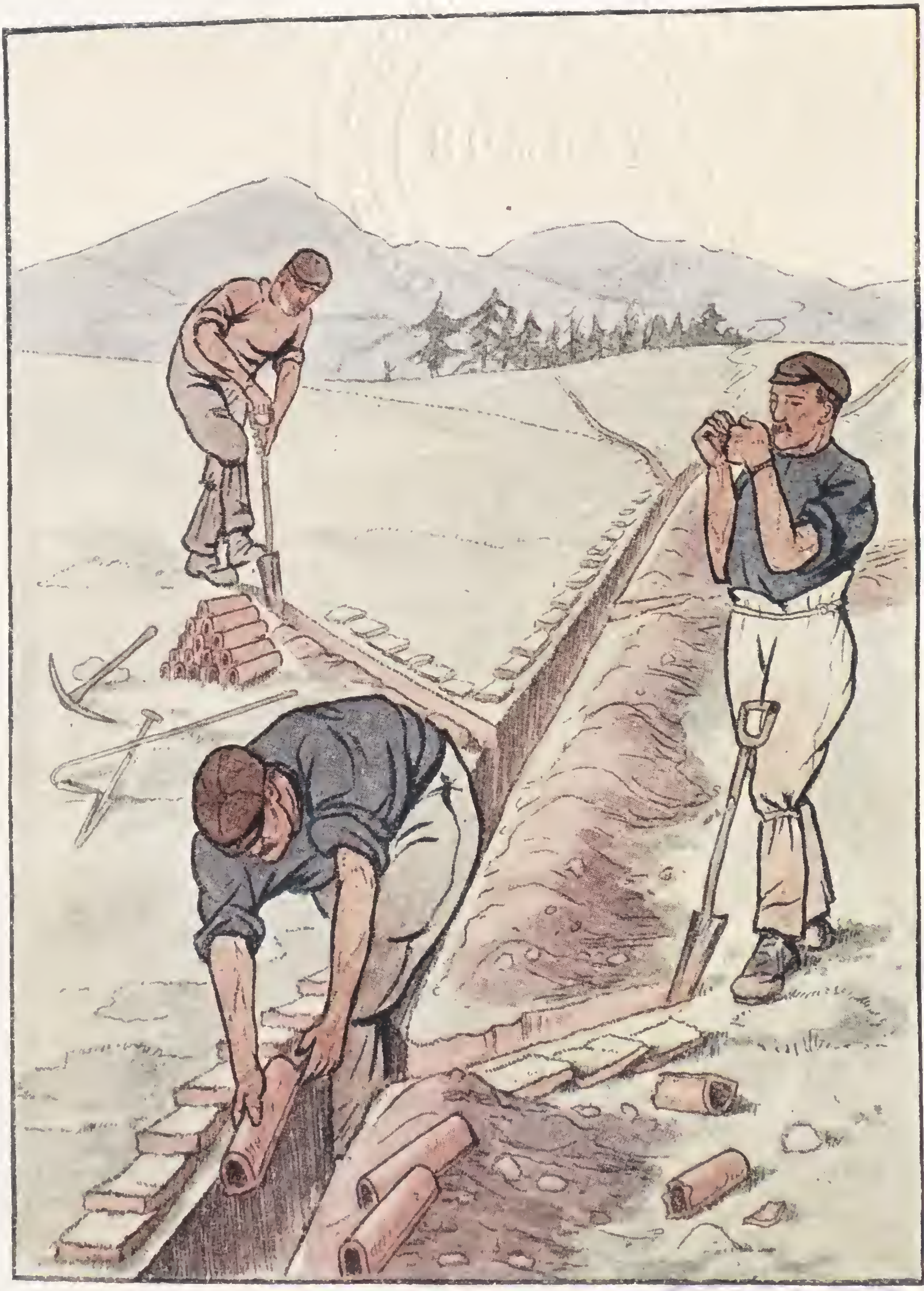
When the drainers start work they first judge by the slope of the ground in which direction the water is to be taken. That is called finding the "fall." The depth of the drains and the distance between each is decided by the kind of soil. They are placed wider apart in a gravelly or sandy soil than in a clay soil.

Many ways have been taken to drain land, either by means of open ditches or by making drains and partly filling them with branches or stones and then covering them up with soil. Nowadays drains are mostly laid with fired clay tiles of different shapes and sizes. The largest are used for main drains, into which the smaller or branch drains are run.

Drainers are neat workers. They first mark off with the spade and with the aid of a line the direction in which the drain is to go. Then they are careful to place the soil on one side of the drain and the subsoil, which is generally poorer, on the other. They use narrow shovels with long handles to help them in the narrow space in which they have to work.

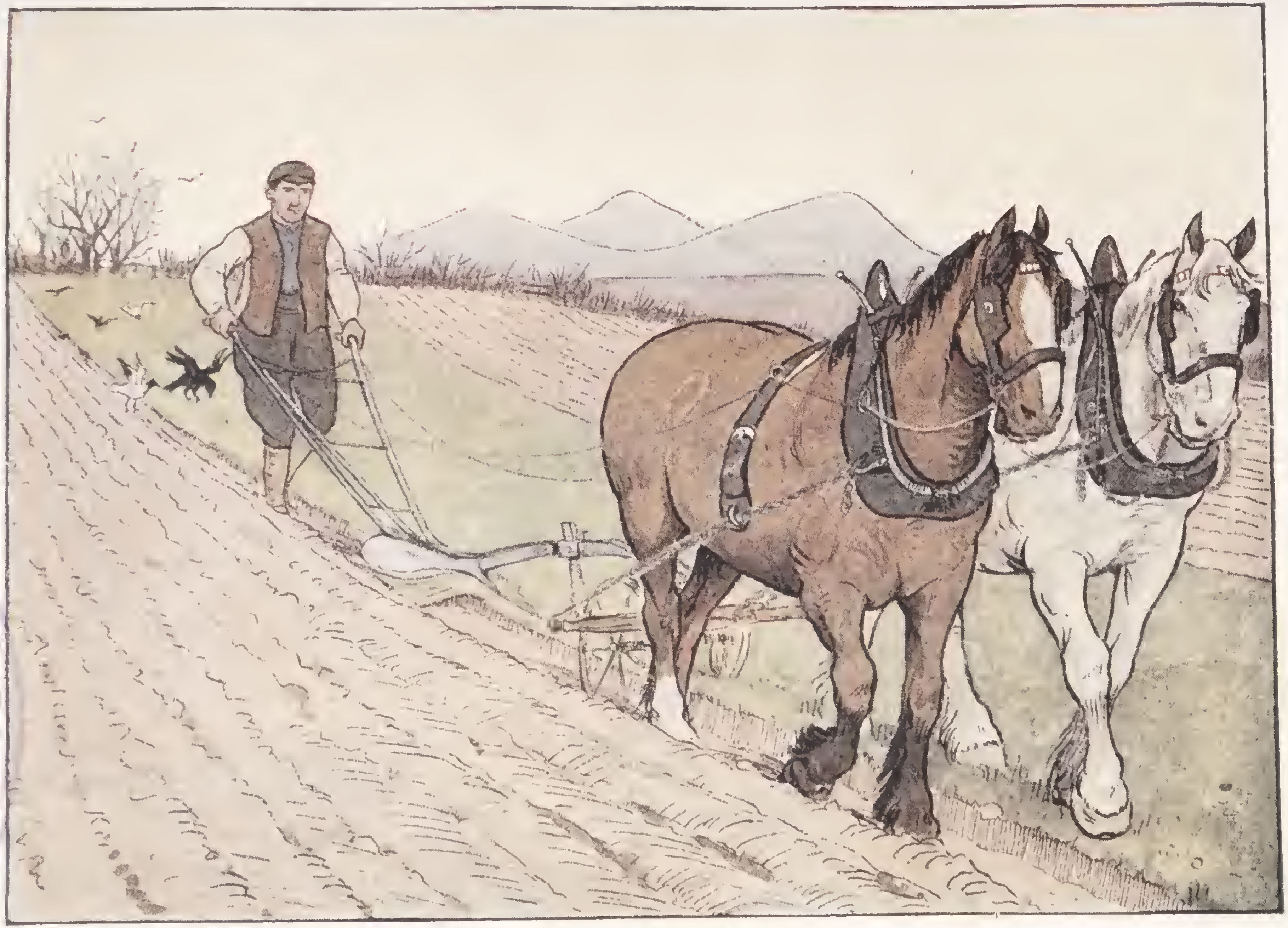
The drain is made no wider than will allow the drainer to move backwards with one foot behind the other to lay the tiles along the bottom. It is then filled with the subsoil first and then the soil. Drains are usually laid about thirty inches below the surface of the ground.

Draining is, as a rule, done by men whose special work it is, and whose fathers and grandfathers perhaps were drainers before them.



DRAINERS AT WORK

BOMBAY.



PLOUGHING

BOMBAY.

PLATE XXI

PLOUGHING

The plough is an implement used for turning the soil over. We dig a garden because it is small, but we plough a field. Ploughing is more quickly done than digging. Both, however, are done for the same reason, to allow the air, rain, and frost to prepare the soil for seed-time. Two, and sometimes more, strong horses pull the plough to and fro across the field. The man holding the plough handles in the picture is the ploughman. He is guiding the horses and keeping the plough steady as it cuts through the soil. The soil it turns over is called the furrow. A straight furrow is one of the marks of good ploughing. Land should not be ploughed in very wet weather, or when snow is lying on the ground.

PLATE XXII

GRAIN CROPS

1. WHEAT

Wheat is our chief food-stuff; but English wheat does not make the best bread. We have to get our bread wheat from foreign lands. English wheat, however, makes good biscuits.

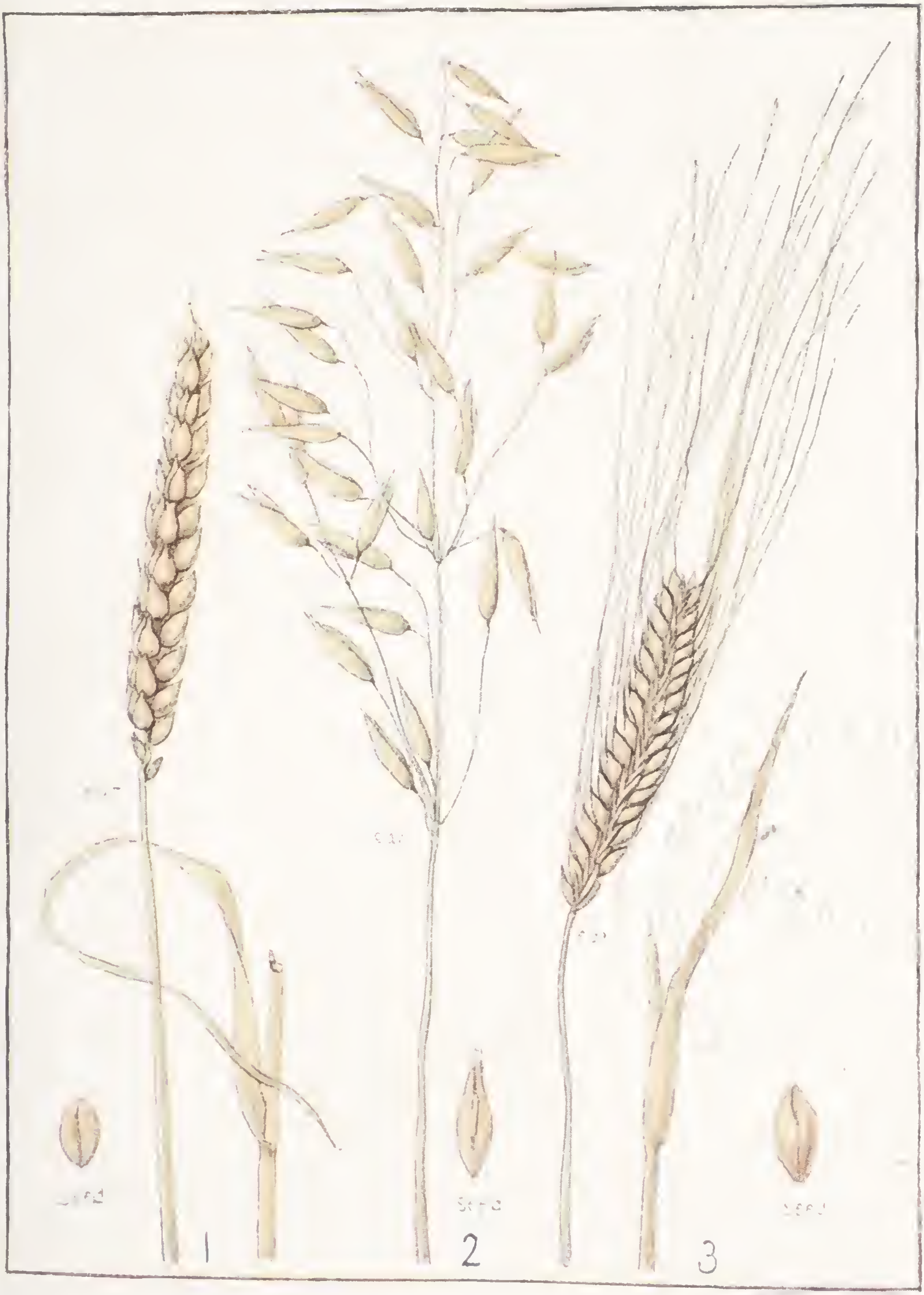
The straw, or stems, of the wheat makes good bedding and thatching. This grain is sown either in autumn, about October, or in spring, about March. Before the seed is sown it is soaked in a liquid which prevents a disease called "smut" from spreading. Bran is got from the grains of wheat. It is the shell, or husk, in which the wheat is found. Bran is useful to the farmer. He gives it to his cattle when they are not well.

2. OATS

This is an important grain crop. It is sown in March, as a rule, and is ready to cut in August and September. Oats are ground in a mill and made into oatmeal. With oatmeal we make porridge. It is a very good food for man. The straw of oats makes good fodder for cattle.

3. BARLEY

The barley crop is easily known by the long beards, or awns, as they are called, that grow at the ends of the grains. The straw is useless for fodder, and makes poor bedding compared to wheat or oat straw. Barley is sown in March and reaped towards the end of August. The best of the crop is made into malt, and is used for



1 WHEAT 2 OATS 3 BARLEY

BOMBAY

SOWING

BOMBAY.

making beer. Pot barley is the grain from which the husk is taken, and Pearl barley is the result of still further shelling. Another grain crop, not in the picture, is rye. It is, as a rule, cut in spring for cattle or sheep before it grows ripe.

PLATE XXIII

SOWING BY HAND

Sowing comes in the spring, and it is the time of busy days and weeks for the farmer. The land has been ploughed and the March winds have dried the soil.

Sacks of seed have been carted into the field and placed here and there, so that it is but a short journey for the sower to go to any one of them for a supply. The sower carries the seed in a sowing-sheet hung in front of him by straps from the shoulders. In some districts a basket is used. He walks from end to end of the field, and guides himself by the furrows. As he steps forward he casts the seed now to his right and then to his left. As he sows with one hand he dips the other into the sheet for more seed. In this way the whole field is strewn with seed.

A harrow is then drawn by horses over the sown land, and the seed is covered up, ready to shoot forth in due time its tender green blades.

PEOPLE'S FREE
BOMBAY

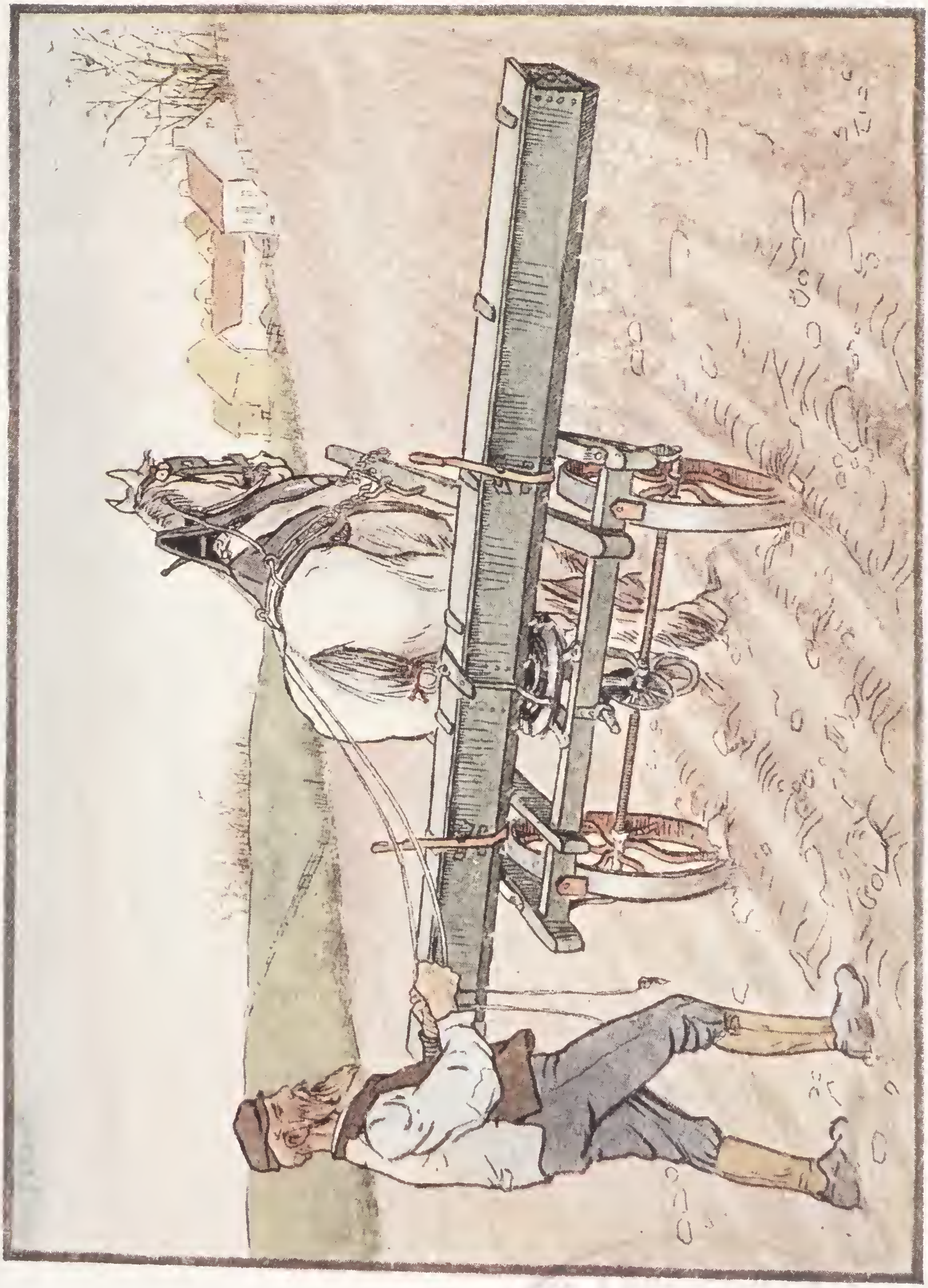
PLATE XXIV

BROADCAST SOWER

Sowing by hand, which was spoken of in the last chapter, has been done as long as man can remember, but it requires skill. Every farmer or ploughman cannot sow, therefore a machine has been made called a Broadcast Sower, which does the same work. Here is one in the picture. It is simply a long narrow box made of wood and divided in the middle. The box holds the seed. At the bottom of it are holes through which the seed falls as the machine is drawn. One horse draws it.

There is another machine used for sowing, but which is less simple and costs more to buy than the Broadcast Sower. It is called a Seed Drill. The seed does not fall from the box as you see in the picture, but drops down little round pipes, the ends of which go a little way into the soil. This machine sows more evenly than the Broadcast Sower, also less seed is needed, because the seed is covered by the soil at once.

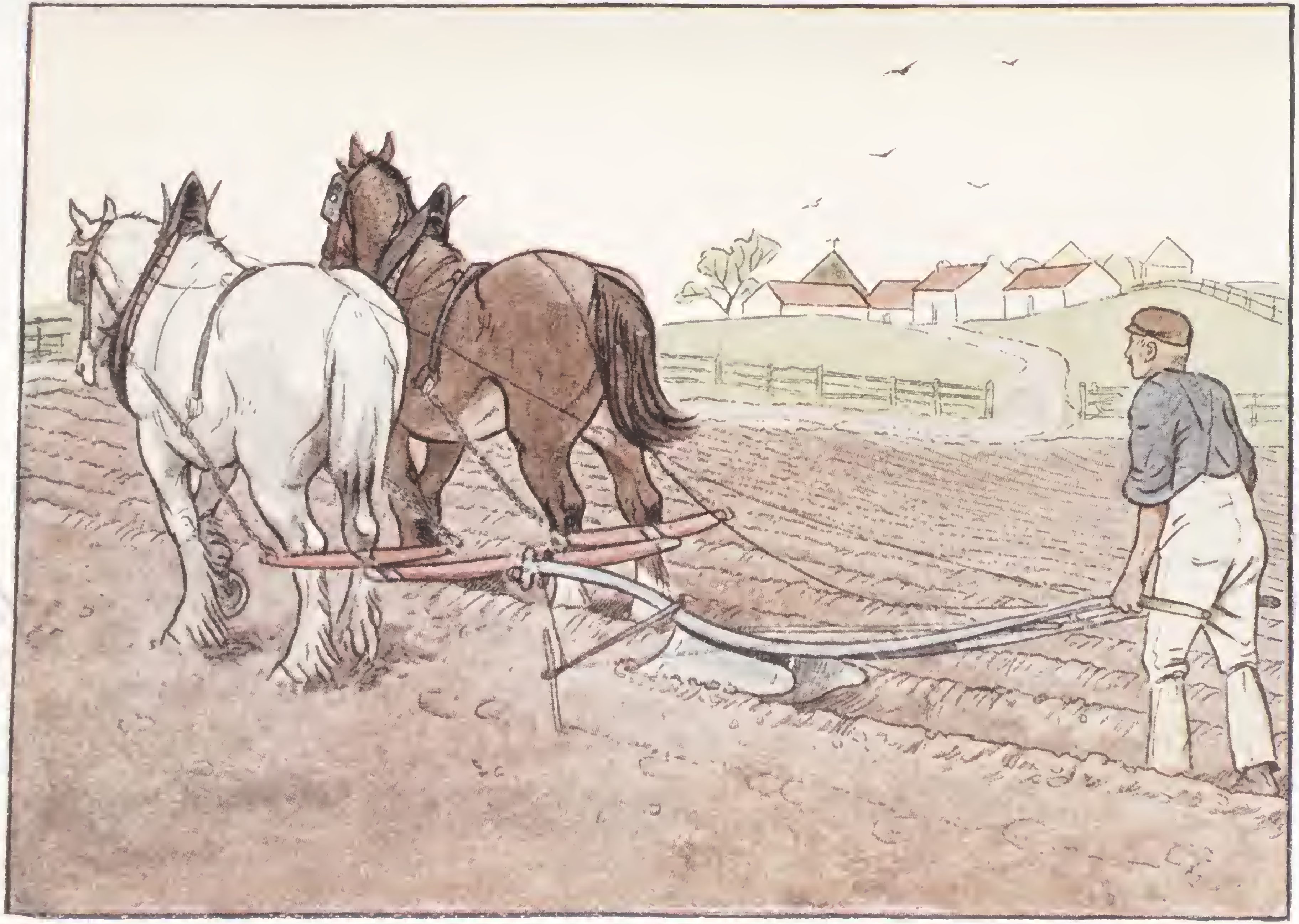
Plate XXIV



BROADCAST SOWER

BOMBAY

PLATE XXV



DRILL PLOUGH AT WORK

BOMBAY

PLATE XXV

DRILL PLOUGH AT WORK

The drill plough is not quite the same as the plough you saw in Plate XXI. It is used for making the land ready for potato-planting and sowing the various root-crops. The land has first been ploughed by the common plough; now it is being made into drills by means of the drill plough, which is differently shaped. The ploughman is helped to keep the drills straight by the mark made by the marker on the surface of the ground.

PLATE XXVI

GREEN CROP

1. POTATO

Green crop is the general name given by farmers to the various kinds of roots grown for cattle-food as well as to cabbage and other such plants. Of all these the potato (1) will be the best known to you. You may see it every day on your own table, yet, I am sure, you are not aware of the care, the time, and the large amount of money that are spent in growing it. Potatoes differ from each other in their form, size, and colour. They can, however, be divided into two classes, round and kidney-shaped. Or they may be divided, as to the time they are ready to lift, into earlies, mid-season, and lates. The potato does best on deep, rich soil, which has been well tilled. Potatoes of last year's growth are used for seed, and these are placed in the bottom of the drill at a distance of from ten to fourteen inches apart. They are then covered with soil by means of a drill plough. The potato plant is fond of the sun, and it grows quickly after it has come up.

A kind of mould, or fungus, sometimes attacks the potato crop. It is first seen as brown patches on the leaves, and, as the dust from it drops to the ground, it finds its way through the soil to the root of the plant. Moist warm weather aids this fungus-growth, but dry clear weather checks it. A mixture in water of certain chemicals if sprayed on the potato plants in the summer will make them less likely to be attacked.

Some kinds of potatoes bear flowers, but not all. The presence of flowers is a sign that the crop of new potatoes is growing ripe.

2. THE FIELD CARROT

The carrot is not grown by farmers as much as the other roots shown in the picture. It is an expensive crop to grow, because much care is needed to thin and weed it. The seed is sown in double rows on each drill. The young carrots that are left to ripen are given about three inches of space. Horses are fond of carrots.

3 and 4. MANGOLD WURZEL

This root is grown for the most part in the Midlands and the south of England, where the soil and climate are best suited for it. It is the earliest to be sown, and is a very uncertain grower. Many seeds do not come up at all, so that it is no uncommon sight to see long stretches of rows bare. The mangold wurzel seed is enclosed in a hard case. Some farmers soften this by steeping the seeds in water before sowing.

The plants are thinned and left to ripen about ten inches apart. The crop must be gathered before the frosts of late autumn spoil them, for the root is tender. The roots, too, must be carefully handled and not cut when the tops and rootlets are taken off. A cut causes them to bleed and so lose their sap.

The roots are stored in pits, and covered with straw and soil.

The mangold wurzel is a most useful food for both cattle and sheep. It is cut into small pieces for them in a machine called a cutter. The roots shown in the picture are of two kinds—the round, called Golden Tankard (3), and long, called Long Red (4).

PLATE XXVII

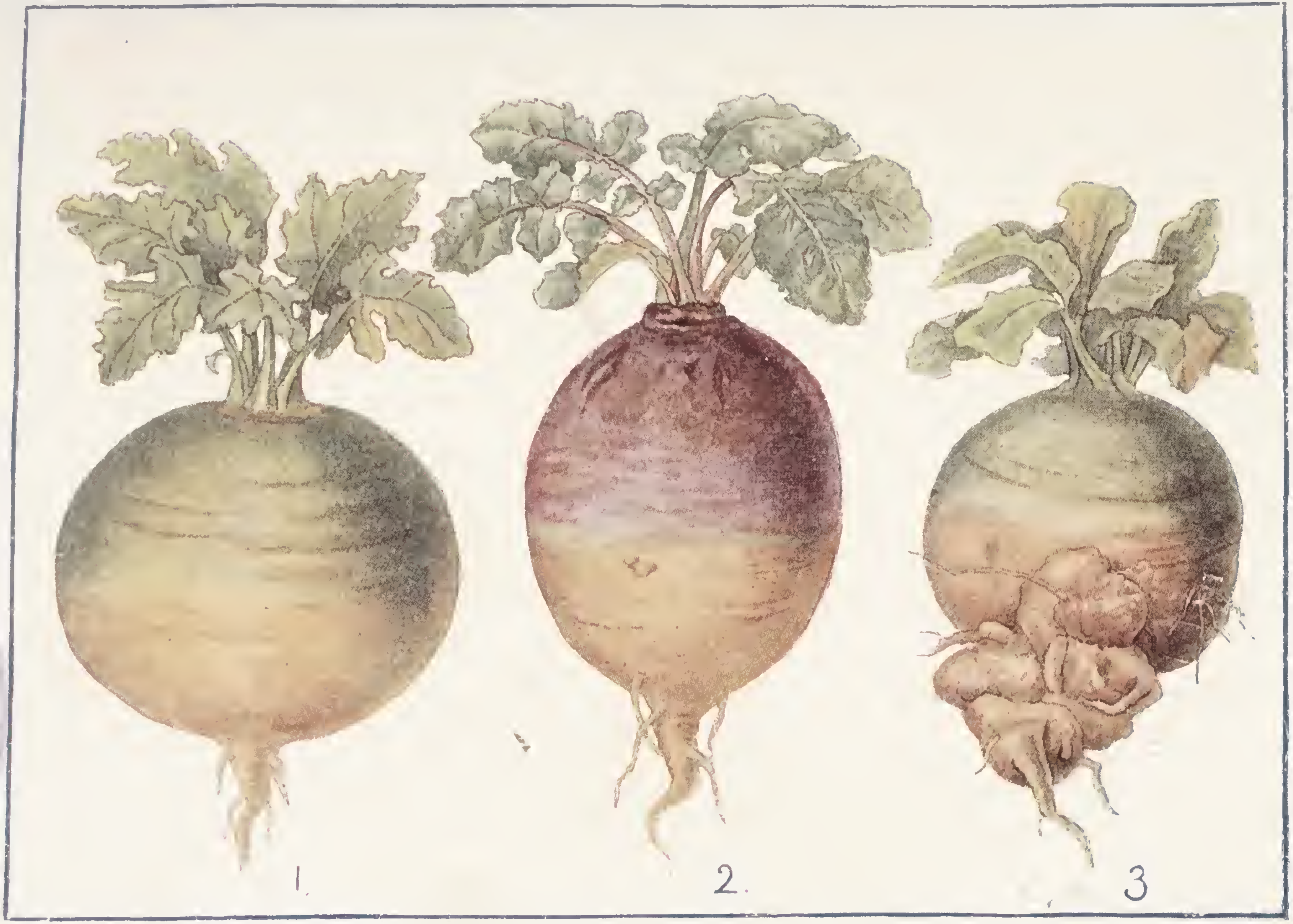
COMMON TURNIP AND SWEDE

The turnip crop is the most important and widely grown of what are called the rotation crops, and provides the farmer with a very valuable winter food for his cattle and sheep.

The word "rotation" is full of meaning to a farmer. It really means "going round." On an arable farm it is the plan on which the farm is worked, and refers to the different crops which are grown in turn on each field. This plan is followed for many reasons, but chiefly because different crops use up different plant-food from the soil. Therefore a change of crops is not so likely to exhaust any one store of plant-food. This rotation of crops lightens work, because some crops require less labour than others. Deep-rooted crops help to make the soil freer and richer for the shallow-rooted ones that follow.

The common turnip (1) differs in a marked degree from the swede (2). The leaves are of a bright green, and spring direct from the crown of the turnip, whereas the swede has bluish-coloured leaves which spring from a neck. The turnip grows quicker and ripens sooner. It is therefore sown later and is used before the swede. It is also not so hardy and cannot stand frost like the swede.

PLATE XXVII



1. Common Turnip 2 Swede 3. Turnip with Finger and Toe

BOMBAY

Both crops are grown from seed sown on the top of drills by means of an implement called a turnip-drill. Where the soil is dry and sandy, they are sometimes sown on the flat.

When the seed springs, you see lines of green stretching along the drills. The plants come up much thicker than can be allowed to grow, but nothing is done until they have grown out of the first smooth leaf into the rough one, except to keep the weeds down. The farm workers then come with their hoes and single the plants—that is, they push out plants to the breadth of about nine inches and leave one, then repeat the action.

The method of reaping the turnip and swede crops is by workers topping and tailing the roots with knives made for the purpose. They are then either carted to the farmyard or stored in the field.

Using the word "turnip" in a wide sense, it may be said that it is an expensive crop to grow. From beginning to end the cost in labour is heavy. Then it is an uncertain crop, because at every stage of the young plant's growth there are enemies in some shape or form waiting to attack it. Later on I shall refer to some of the insect pests. Here I shall only mention a disease called finger and toe, which causes the turnip root to divide like fingers (3). When the disease is advanced, the turnip becomes filled with decayed matter. The first cause is the want of lime and other sources of plant life in the soil. If this is allowed to go on, the seeds of the disease lie waiting in the soil, ready to spring afresh when the next turnip crop is grown, even although years may have passed.

Soil affected with this disease should have a top-dressing of lime and a long rest from growing a turnip crop. It should also be kept free from all weeds that will harbour the seeds of the disease.

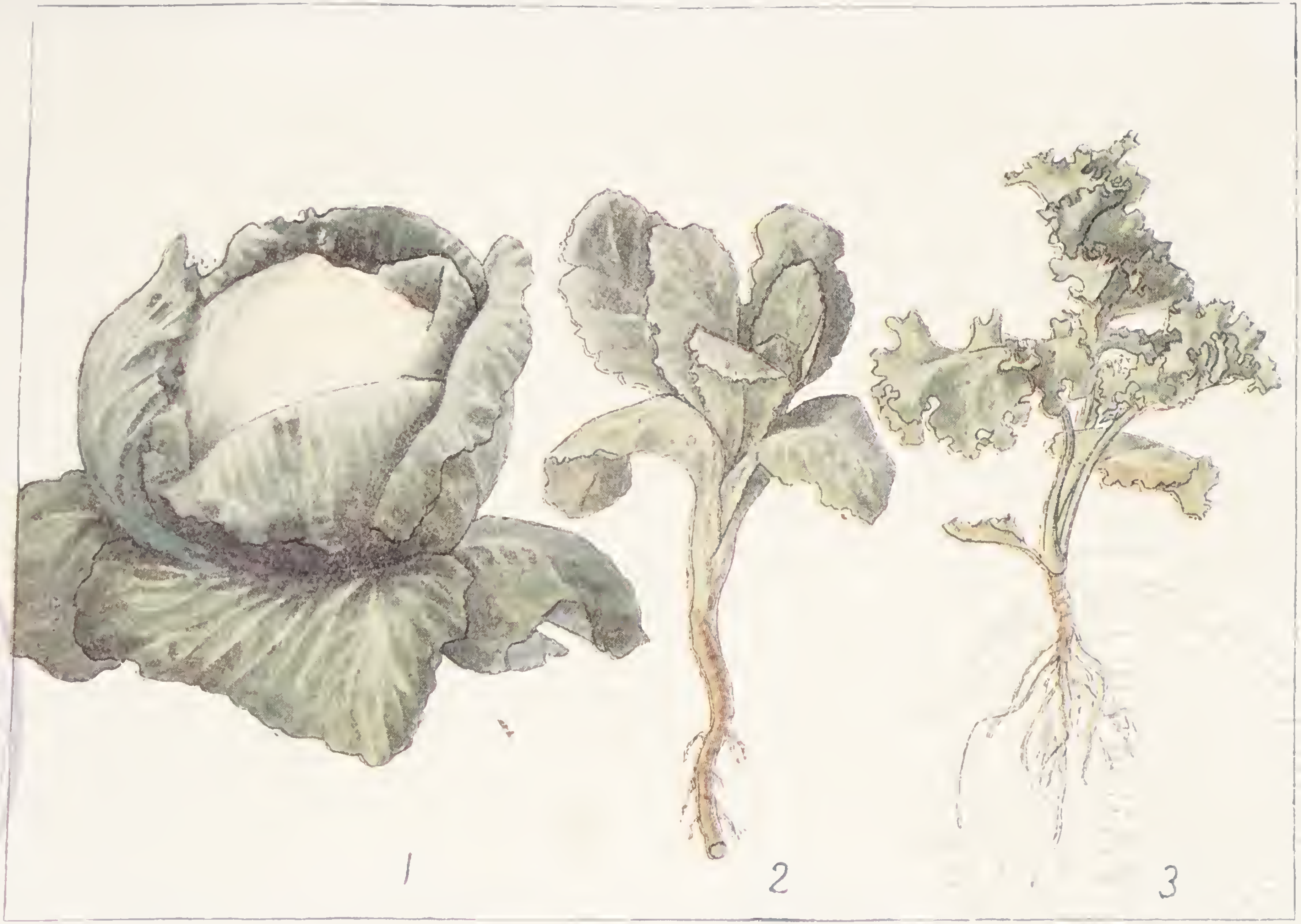
Rape is a plant closely related to the turnip family. It is grown for its leaf, which is similar to the turnip—but it has no enlarged root. It is sown broadcast, often as a catch crop—that is, it is sown on soil that has borne a crop which has been reaped early. For example, it is often grown after early potatoes which have been lifted at the end of June. It is largely used for fattening sheep.

PLATE XXVIII

CABBAGE (1)

For dairy cows and sheep there is no better natural food than cabbage. It provides solid meals and there is no waste, for the saying, "the nearer the bone the sweeter the meat," applies to this crop, as sheep will nibble the cabbage stalks with evident enjoyment.

PLATE XXVIII



1. Cabbage 2. Young Cabbage Curly Green

PEOPLE'S FREE R
BOMBAY.

Cabbages are usually transplanted into drills from a bed which has been grown from seed sown in the autumn. The young plants are either put in with a dibble, which is a pointed stick, or with a spade at the end of March or the beginning of April. They are planted about two feet apart. The drills are usually thirty inches wide, so as to give the cabbage room to expand.

The cabbage requires a plentiful supply of farmyard manure, helped by frequent small doses of nitrate of soda, which is one of the most powerful of chemical manures. It is dealt out carefully with the hand in pinches to the root of each plant.

A richly-fed cabbage is easily known from its robust appearance and dark green colour.

From the picture you will see the difference between the young cabbage (2) and the full-grown (1). About the middle of its life the cabbage begins to form a heart, which increases and hardens till you have the ripe plant, weighing often as much as twenty pounds.

The cabbage has its enemies to fight like the turnip. For this reason, the earlier the crop is sown, the stronger it will be to resist the attack of such a pest as the cabbage-root fly, the maggots of which eat their way into the centre of the stalk and so kill the plant.

Besides the Drumhead, which is the name

of the common field cabbage, there are early kinds.

The Curly Green (3) or Kail, as it is called in Scotland, belongs to the cabbage family, but is one of the open-headed kind, another of which is called "Thousand-headed."

Every farm garden has a plot of greens for use in the kitchen or to feed the poultry. They are grown on early soils after potatoes. The young plants are grown like cabbage. In the winter they are cut and bunched and sent to city markets.

The curly green (3), shown in the plate, is a young plant.

PLATE XXIX

PLANTING EARLY POTATOES

Here we have a picture which shows how early potatoes are planted. The seed, which has been saved from last year's crop, is brought to the field in a cart. It is held in small boxes in which it has been protected all winter from the light and frost. From each potato you will notice a sprout is growing. That is the first appearance of the young potato plant. Each potato is placed with care in the bottom of the drill about ten or twelve inches apart. They are then covered with soil by the drill plough.

Early potato planting takes place in the end

PLANTING EARLY POTATOES

PEOPLE'S FREE R. & LIBRARY
BOMBAY.

of February and in March. The crop is lifted about the middle of June by bands of workers with potato-forks.

Less care is taken with the seed of late potatoes, which is taken to the field in sacks, as it is not sprouted.

PLATE XXX

POTATO-DIGGER AT WORK

In autumn the potato crop which has grown from seed planted in spring is ripe. This you can tell by the withered tops. It is not taken out of the ground with forks as the early potato crop is. A machine called a potato-digger is used. This machine has a broad blade of iron which goes below the potato plant and raises it up. Now, look at the picture. Do you see that star-shaped wheel at the back of the machine? It goes round and round at a great speed, and its points, which you see are forked, strike the potato plant, and throw out the potatoes, so that they are left on the ground to be picked up. Notice that the potatoes are being thrown in one direction, and that is away from the potato drills on the left of the picture. The wooden screen which hangs out from the digger keeps the potatoes from being hurled too far from the machine.

After the potatoes have been gathered, the farmer may either sell the best, or he may store the whole crop in narrow pits. If the latter, he thickly covers the potatoes with straw and then with soil to keep out the rain and the frost.

PLATE XXXI

CHIEF GRASSES OF THE FARM

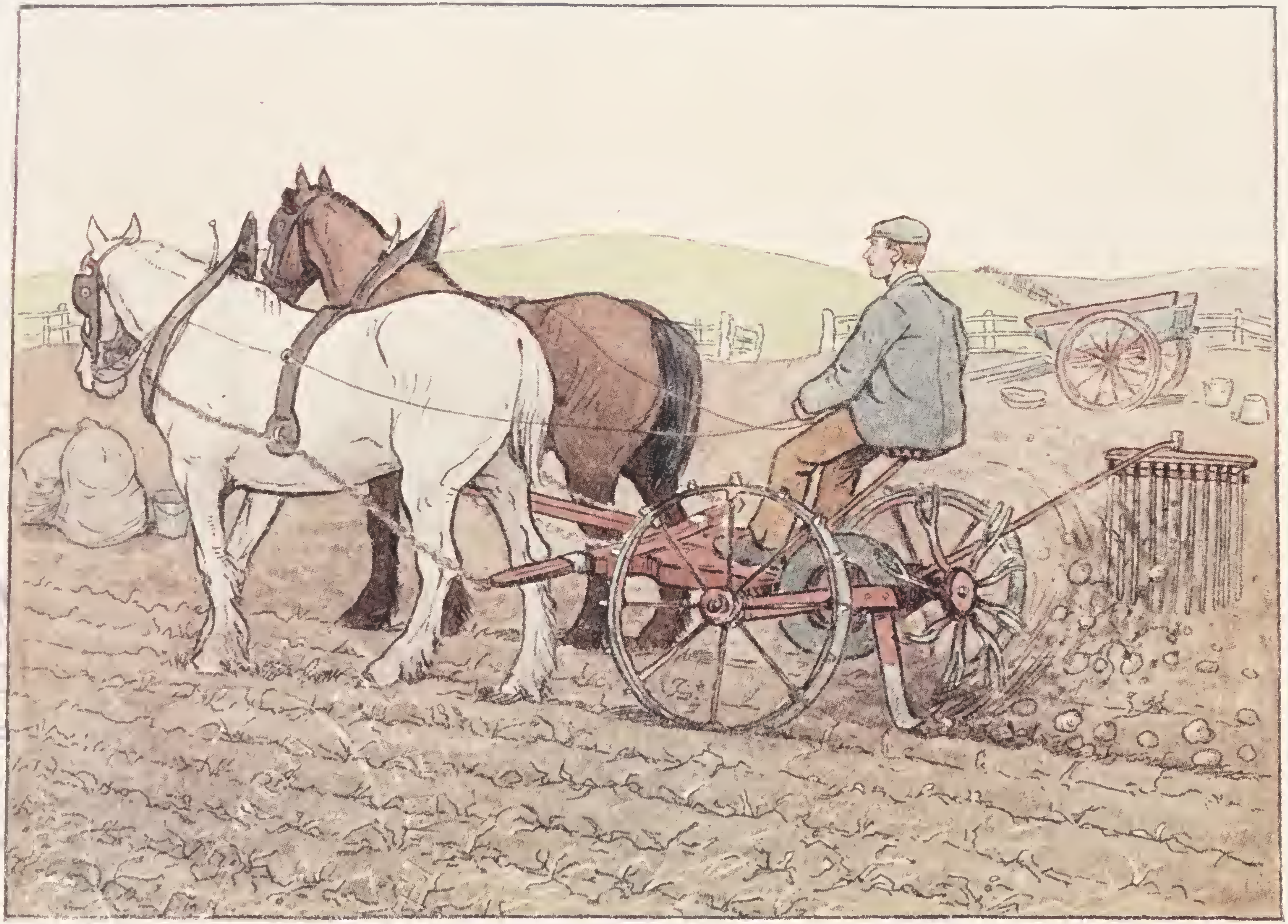
Just as a carpet is made up of a great variety of threads, so a grass field consists of many different grasses. Each differs from the other in various ways. It may be in the time of springing and of flowering, or it may be in hardiness and length of life. Let us look at some of the most important of these grasses.

I. RYEGRASS

One of the most valuable and the most abundant of the grasses is Ryegrass. It is easily known by its flattened head. Each little growth at the sides of the stem is a floret, and these contain the seeds of the plant. Notice how they are placed, not opposite to each other in pairs, but each one by itself. The plant grows about two feet high when left for hay, but, as animals like it, you do not often see it at this height in a field

FREE R. R. & LIB
BOMBAY.

PLATE XXX



POTATO DIGGER AT WORK

BOMBAY.

given up to pasture. It is a hardy plant. Most of the Ryegrass seed comes from Ayrshire, in Scotland, and from the north of Ireland.

2. ITALIAN RYEGRASS

Italian Ryegrass is said to have been first grown in a district in Italy. It was first grown in this country by an Edinburgh gentleman. In some ways it differs from Ryegrass, being larger and stronger. It lives only two years, whereas ordinary Ryegrass comes fresh every year. The florets spring from the stem singly, and have awns, or beards, at the end of each. Italian Ryegrass is largely grown because it not only yields big crops, but is a rich food for cattle. It is, too, a very hardy plant. Much of the seed sown comes from the Continent.

3. COCKSFOOT

This grass is found in its natural state in most countries of the world. Its name, as you may see from the picture, arises from the likeness of the head to a cock's foot. Though growing wild in this country, it was from America it was first brought as a farm grass. There it is called Orchard Grass, the reason for this being that it will grow under the shade of trees, which all grasses will not do. Cocksfoot is a very useful grass, and both cattle and sheep are very fond of it. If left to grow tall it looks ragged and unsightly. In this condition its foliage is rough to the touch and the stems are coarse and hard.

4. TIMOTHY

Timothy is a meadow grass. Like Cocksfoot, it was brought from America. Timothy Hanson was the first to cultivate it in this country. Now you see a reason for its name. This grass is very hardy. It grows best, however, on cold clay or peaty soil. When once Timothy has taken a firm root in the soil it is a hard matter to get rid of it, even though the land is ploughed for root crops or wheat. It is a rich food for horses, and they are very fond of it. Timothy and Meadow Foxtail (Plate XXXII) look rather like each other, but there are differences. The Timothy ear is rough and of a rich green colour, whereas that of the Foxtail is smooth and silver-grey in colour; the florets of the Foxtail have silky beards, while those of the Timothy have none. Foxtail ripens early, Timothy late. The seeds of the Timothy, which are like strawberry seeds, are sometimes used, so it is said, for putting into jams.

PLATE XXXII

CHIEF GRASSES OF THE FARM (*cont.*)

1. MEADOW FESCUE

Meadow Fescue is one of a family which includes, among others — Tall Fescue, Sheep's Fescue, and Hard Fescue. It is one of the most valuable grasses we have. Both in pasture and as hay, horses and cattle are very fond of it. The herbage is always tender and juicy and keeps green, so much so that in parts of America it is called Evergreen Grass.

It is a moderate-sized grass with flat, rich green leaves, and a nodding head turned to one side. The seed is like Ryegrass seed, but there are well-marked differences. It is deep-rooted, and its habit is to grow in tufts. Damp clay or marshy soils suit it, but it is seen at its best in water-meadows.

Meadow Fescue has its likes and dislikes as to soil, and no grass is more altered in character by soil and climate.

2. MEADOW FOXTAIL

Meadow Foxtail is the only one of its family that is of service to the farmer. Indeed one member is among the worst pests of the farm—Slender Foxtail or Blackbent, or Hunger-Weed.

Meadow Foxtail shares with Sweet Vernal the honour of being the earliest flowering of the useful grasses.

In appearance the ear is not unlike the fox's brush, and is soft and silky to the touch. The softness and colour are due to the silky hairs attached to the florets. The leaves are long and broad and are soft and juicy. It spreads by means of creeping shoots from the main stem. These shoots develop little roots at intervals.

Its leafy herbage provides early and plentiful food for farm animals.

Few grass plants stand cold better than Foxtail. It also, like Cocksfoot, can flourish in shady places and under trees.

3. CRESTED DOGSTAIL

Crested Dogstail is a short, fine grass. It is one of the chief sheep grasses of this country. Sheep are, indeed, so fond of it that if the stalks did not harden before seed-bearing time, and the sheep then lose taste for it, they would kill it out.

Along with Hard Fescue and Sheep's Fescue, Crested Dogstail forms the best of upland sheep pastures. It helps to give to pasture a close growth, as if one were walking on the most expensive of Turkey carpets, or, as a farmer would say, it helps to make a good sole of grass.

Crested Dogstail is also said to aid in the prevention of foot-rot, a dreaded trouble that affects sheep's feet.

The ear of the Crested Dogstail grows spike-like. It cannot be mistaken for any other grass. The leaves are narrow, and taper upwards, and near the ground the leaf covers are yellowish-white in colour. Almost any soil suits it, and it is very hardy. Being deep-rooted, it can stand drought.

Dogstail is not a hay grass. It is in great favour for lawns, pleasure-grounds and deer-parks. Deer are very fond of it.

PLATE XXXIII

CHIEF GRASSES OF THE FARM (*cont.*)

1. WHITE CLOVER

The members of the clover family have one feature in common. The leaves consist of three leaflets. It is considered lucky to find a four-leaved clover, because it is rare.

Clovers form a choice food for sheep and cattle. The flower-heads are sweet with honey, which doubtless you know, for can you not say that—

> "Where the bee sucks, there suck I"?

A remarkable feature of clovers is the power they have of collecting the very valuable plant food nitrogen on their roots, in little store-rooms called nodules.

When certain plant foods such as lime and potash are used up from the soil the clovers suffer from what is called "clover sickness," and do not grow. If, however, the land is top-dressed with lime or potash, or a mineral phosphate called "slag," in twelve months the clover in most cases makes a wonderful recovery. This sickness is also caused by the eel-worm, which attacks the root and stem of the plant.

Clover seeds are very small like pin-heads, and are of varying shades of green and yellow. Seed merchants when buying their stock have to examine the samples very carefully to detect weed seeds, which if sown with the clover would perhaps destroy the crop. One of the worst pests they are always on the lookout for is Dodder. Whenever this weed finds out the clover it clings to it and lives on it, no longer drawing its life from the soil, with the result that the clover is killed.

White or Dutch Clover gets its second name because it was first cultivated in the Netherlands. It is a native of this country, but it has only been some two hundred years in cultivation here.

It is of a creeping nature. It has both surface roots and a long single root which goes deep down into the soil, providing nourishment to the plant during drought. Warm moist weather suits white clover better than drought or coldness. The flower-heads are cream-coloured and the leaflets prettily marked.

White clover is only suited for pasture. It fattens sheep and is especially good for them.

2. RED CLOVER

Red or Broad Clover is the handsome plant with its fine head of deep red flowers that lends a rich colour to the hay crop.

It is the most common of all the clovers. Though not a very hardy plant, it will yet grow on most soils.

Red clover contains a great amount of moisture, for when it is dried it weighs only one-fifth of its weight when green. It should be cut for hay when in flower.

The best seed is grown in England. It is sent to this country, however, from all parts of Europe and America. Much that comes from abroad contains many weed seeds. As many as thirteen different kinds of weed seeds are to be found in red-clover samples.

This member of the clover family more than any other suffers from "sickness." When such is the case it should not be sown on the soil affected for a number of years.

There is a variety of red clover called cow-grass. The seed of the one is hardly to be told from the other, but cow-grass is later in flowering than red clover.

3. TREFOIL OR YELLOW CLOVER

Trefoil is not a true clover, but is always classed as such. It has pale green foliage with a small yellow flower-head which appears from May to August. It is sometimes called Black Medick, because of the black seed-pods it has.

Trefoil stands cold better than heat. It comes earlier than any other clover, and so gives a nice bite for sheep and cattle. The colour and flavour of butter which is made from the milk of a cow which has enjoyed trefoil is by this said to be improved.

4. ALSIKE

Alsike Clover was first brought into notice by the success with which it was grown in the district of Alsike in Sweden.

The flower-heads are pale pink. It is hardy by nature and is suited for damp soils.

If it were better able to stand drought it would be more largely sown, as it will grow on "clover-sick" land, where red clover will not.

PLATE XXXIV

USELESS GRASSES

It may with reason be asked, If certain grasses are useless, why are they sown? The answer is, that in most cases where such grasses grow, it is because they are self-sown and are natural to the soil. Every arable farmer can point to spots in his fields where certain useless grasses and weeds find a home in spite of frequent attacks to root them out. If a farmer neglects to take every chance to root out such pests, they soon spread.

If instead of buying the best grass and clover seeds a farmer tries to save money by sowing inferior kinds, he will most likely be sowing at the same time the seeds of useless grasses and weeds. This will mean, if he be no sluggard, many weary hours of labour, for as the proverb says, "one year's seeding means seven year's weeding."

On pasture-land where the soil is inclined to be poor, the useless grasses soon obtain the mastery over the useful or feeding grasses if the latter do not receive help by manuring.

A grass is useless if horses, cattle, or sheep will not eat it. It shows that it is either harmful or gives no satisfaction if eaten.

1. COMMON BENT

Of all the members of the family to which Common Bent belongs, there is only one which in some degree is of use. That is Feorin, or Creeping Bent grass, which sometimes finds a place in grass seed mixtures.

Bent often goes by the name of Twitch or Squitch. It is to be found in poor meadows and in arable land in dry, gravelly, sandy places. It is a troublesome weed to get rid of, as it quickly spreads by means of trailing stems that root at the joints.

2. YORKSHIRE FOG

Yorkshire Fog is one of the most common of British natural grasses. It got its name because it was largely grown in that county when natural grasses were first cultivated. From a closer knowledge of it, however, we have now placed it among our weed grasses. Farm animals do not eat it unless driven to do so by sheer hunger.

Another name for the grass is Meadow Soft Grass, which it gets from the fact that the whole plant has a delicate soft covering. Its appearance in pasture is generally a sign of poor soil inclining to peat, but it is to be found on good soils also, although in a much less degree. Yorkshire Fog flowers from June to July. The flower is pretty, ranging from green to purple in colour. When the seed ripens, the plant becomes whitish brown and withered looking.

Seed merchants keep a careful lookout for the seed of Yorkshire Fog in samples of useful grass seeds such as Ryegrass, Meadow Foxtail, and Crested Dogstail.

3. COUCH GRASS

Couch grass is the greatest enemy of the arable farmer in all the army of weeds that he has to fight against. Yet, strange as it may seem, this pest and wheat, which is our chief bread-stuff, belong to the same family.

The chief feature of this weed grass is the long underground stems which it sends out. Roots and fresh shoots start from every joint of these stems. So rapid is the growth that soon a network of roots is formed, making a bed or couch, hence the name Couch grass.

The only safe way to get rid of this pest is to loosen the soil with dung forks, pick the couch grass stems with the hand, then burn them when dry. So full of life are the roots that if any broken pieces are left in the soil they will spring afresh as new plants.

Couch grass or Quickens, as it is sometimes called, when growing in hedgerows is said to promote the fungus called Rust which attacks wheat and other grains.

4. WILD OAT GRASS

Wild Oat grass, though useless, comes of a good family, for the parent of it is the cereal oats, and among grasses it has two relations living useful lives—Yellow Oat grass and Tall Oat grass.

This weed grass grows among the oats and barley. In appearance it is like oats. The florets have harsh crooked bristles called awns, and are covered with coarse brown hairs.

Wild oat grass flowers in June and goes to seed in July. The plant dies before winter, but the seed springs up afresh each year.

Another member of this family is called Onion Couch because the roots are formed of a string of from two to five bulb-like swellings somewhat resembling onions in shape. It is another weed which is troublesome to arable farmers.

5. HAIR GRASS

Hair grass is one of those grasses which, when you are in the fields or walking along the country roads, you pick because of its beautiful purple-tinged head which gleams like burnished silver. Alas, its appearance is an eyesore to the farmer —to him it is a useless grass.

It grows in ugly tufts, and cattle carefully eat round the coarse, hard herbage. It is the "windlestrae" of Scotland.

Its appearance in pastures means a need for draining, as it likes wet places. Like couch grass, it fights hard for life, and must be carefully weeded out.

It has been highly spoken of for growing in woods and shady places as a shelter for game.

PLATE XXXV

WEEDS

Suppose you are walking across a field with two friends, the one a botanist, the other a farmer on whose ground you are. Your talk is about what you see at your feet and round about you. To the botanist every plant that goes to form the green carpet on which you tread belongs to a class and a tribe. He takes a flower, root and all, and divides it into the several parts that go to form the whole plant.

The farmer, as the man who is seeking to make a living from the soil, notes the grasses that his animals are eating to the ground and those they leave alone. He looks with unkindly eye on the countless buttercups and daisies, knowing that they are taking up room and food which useful grasses might have had. Though poets have sung their praises, they are but weeds to him.

Each one looks at things from his own point of view. Do not be surprised and grieved, therefore, when you find that the farmer calls those flowers which you love and admire, just weeds.

Want of space prevents the artist from showing you the more common weeds, such as the field thistle, the nettle, the daisy, the buttercup, the dandelion, and the poppy.

A book could be written on the different kinds of field thistle. I shall mention only two facts about it.

When grass is parched for want of rain, the thistle flourishes because of the long root which it sends deep down into the soil. It should not be allowed to seed, but should be cut down before the flowers open.

There is also a curious and interesting fact connected with the nettle which I should like to mention in passing, and that is that you will always find nettles growing where human beings have lived. On a moor or a hillside the presence of them is often the only trace left to show where once a shepherd's or a gamekeeper's cottage stood. Beyond the site you will find none.

The weeds I wish to refer to are perhaps less familiar to you than those I have mentioned. Each in its own soil and haunt is only too well known to every farmer.

1. CHARLOCK

Charlock is also known as Runches, Skellock, Wild Mustard, and Yellow Weed. In June it disfigures many a cornfield by its thousands of heads of yellow flowers.

It belongs to the same family as the mustard plant and is like it. It is a most troublesome weed, both among the corn and green crop. Although it dies yearly, it springs afresh from the

BOMBAY.

seed. It is rarely seen in pasture, but the seeds lie dormant, and will do so for years, till the land is again cropped, when it appears as vigorous as ever.

Charlock grows chiefly on thin, gravelly soils. It is the custom now to kill this pest by spraying the corn crop affected with a solution of a chemical called sulphate of copper. It is done in the beginning of June, before the flower appears, and when the charlock is in the rough leaf. The chemical burns the plant and prevents the weed seeding, but it is said to encourage the corn rather than otherwise.

2. SPURRY

Spurry is another weed that is to be found in the cornfield, as well as in poor sandy soils. It is a white-flowered plant, with weak trailing stems. It is covered with hairs and is sticky to the touch. At every joint of the stem is a close ring of soft narrow leaves. When growing in abundance it gives off an unpleasant smell.

On the Continent it is sometimes grown as a crop and used for fodder. Hens are said to be fond of it and to improve in laying by eating it.

3. DOCK

The Dock, or Docken, as it is called in Scotland, with its upright reddish stems and broad leaves, is a common weed on the farm, both on pasture and arable land. It is difficult to get rid of because of its deep root, which sends up a fresh plant if broken.

4. CHICKWEED

Doubtless you may have gathered chickweed for caged birds, which are fond of its leaves and seeds. It is a light green coloured surface weed that grows on arable land. The stems have a line of delicate hairs running down one side only. It is related to that blue flower called the corn-cockle which grows among the corn.

Chickweed is not difficult to pull up, but is not easily got rid of, because it seeds so abundantly, and the seeds ripen in all weather above freezing-point; moreover, it bears seed when only a few weeks old.

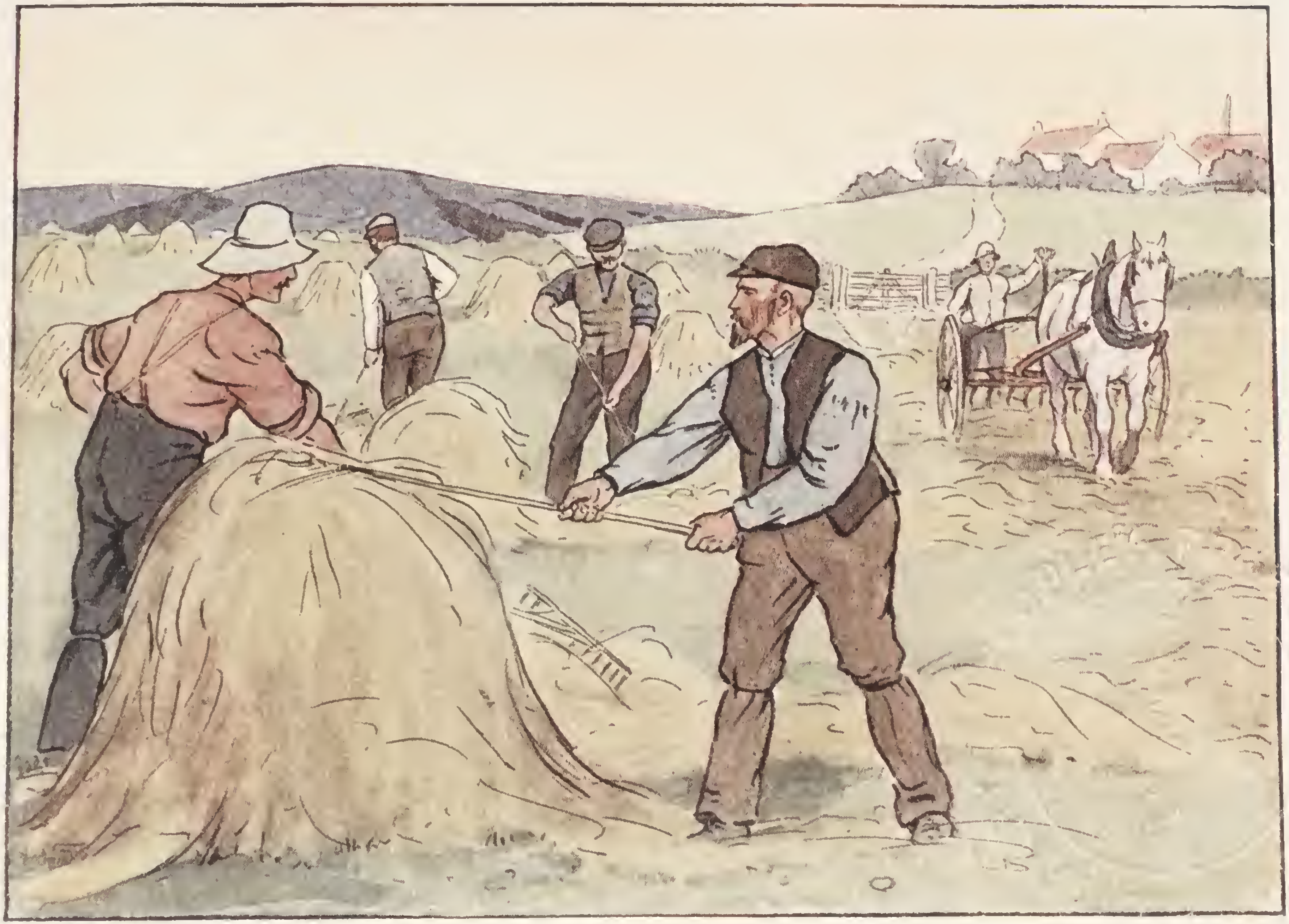
5. COLTSFOOT

Coltsfoot gets its name from the likeness of its leaf to a foal's foot.

The yellow flowers, set on almost bare stalks except for small scale-like leaves, are well-known objects in the early spring. The first flowers have blossomed and gone to seed before the plant has sent up the broad leaves from which it gets its name.

Coltsfoot is a very troublesome weed to get rid of. The underground root-stem goes often very deep. It is easily broken, and what remains is sure to spring afresh. The best time to deal with

PLATE XXXVI



HAYMAKING

BOMBAY

it is when it is in flower, so as to prevent it from seeding.

The presence of coltsfoot is an almost certain sign that the soil needs draining, as it flourishes where there is dampness.

PLATE XXXVI

HAYMAKING

To most boys and girls the scene shown in the picture is well known. Haymaking means much happiness and fun to them, but to the farmer it means anxiety and hard work. This is because he must have fine weather to make good hay, or, in other words, he must make his hay while the sun shines.

There is not space here to tell you about haymaking. In a very few words it may be said that the grasses (Plates XXXI, XXXII, XXXIII) have flowered, then been cut down, and have lain long enough to be dried by the sun. The long hay rows are then turned with hand-rakes by the workers. When the turned hay is ready it is gathered together into bigger rows by that machine which you see in the picture is drawn by the white horse, and which is called a horse-rake. Then the hay is made into haycocks, and after that, if the weather is suitable, it is carted to the rickyard. In Scotland, where the weather is not so settled as in England, the hay is made into coils, which are small haycocks, and then into ricks in the field. Then it is built in a stack.

PLATE XXXVII

BUILDING A HAYSTACK

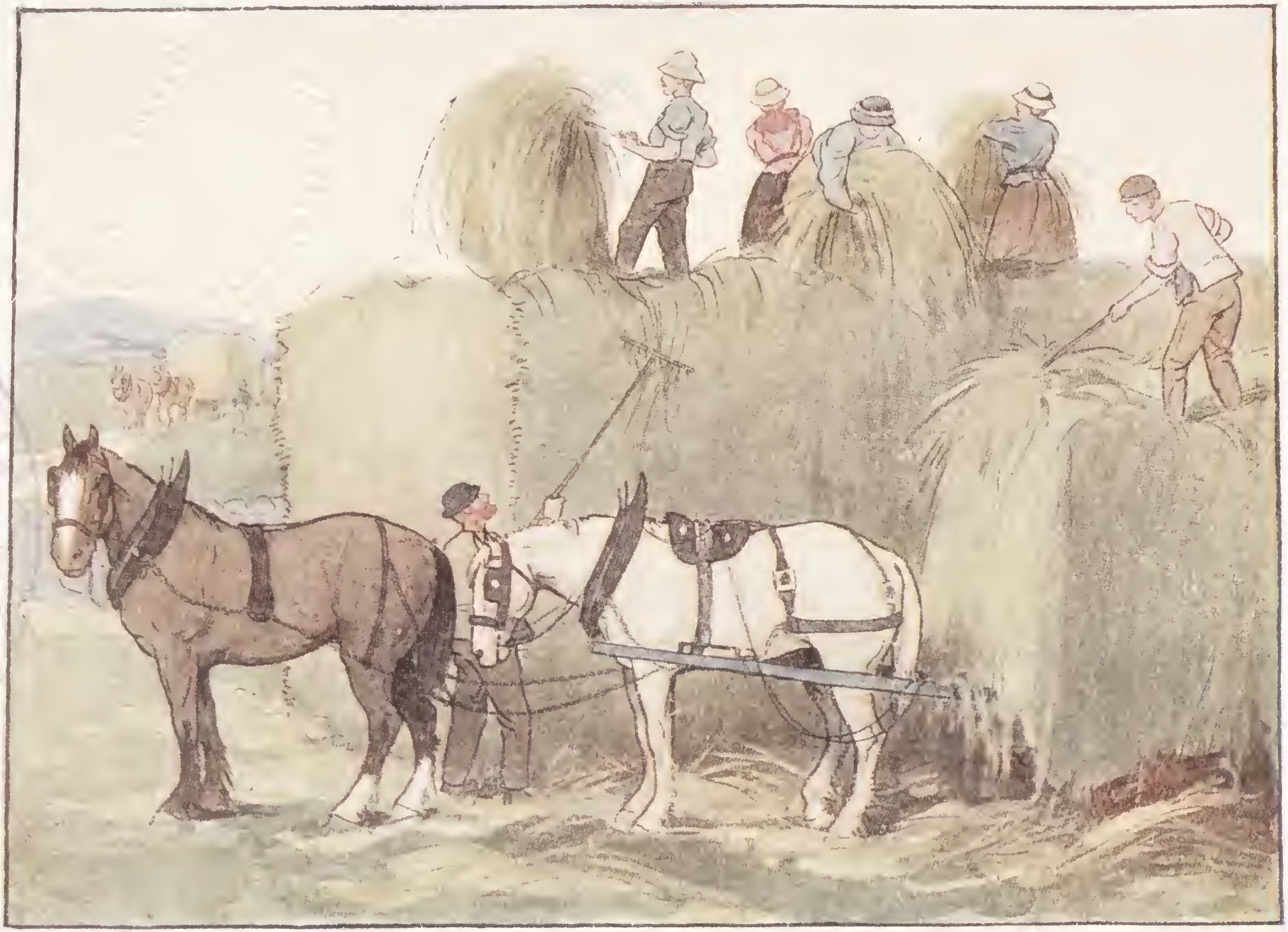
When the haystack is built, hay-time may be said to be over.

If the hay is not built in a shed, it is stored in a stack, which may be either square, oblong-shaped, or round. Either of the first two shapes are to be preferred if the hay is to be sold, and therefore likely to be trussed or baled—that is, either cut into blocks and tied, or steam-pressed and tied.

The aim in building a haystack is to build it rainproof. To do this the surface of the body of the stack must be kept level, and when the head is being built, the centre must be rather higher than the edges.

Where the head begins is called the eaves. In the south the stack is made to swell out from the bottom to the eaves, so that the rain drops from the eaves clear of the bottom. In Scotland that feature is not nearly so marked.

To make the stack solid, the farmer has on it as many workers as he can spare to tramp the hay. As the builder, who is on the stack, requires to know how it is shaping, a man guides him from the ground, and rakes the sides of the stack as he goes round. This man also



BUILDING A HAYSTACK

BOMBAY

watches where the stack needs support and puts in props. Thus he is said to "keep" the stack.

As you see in the picture, the hay-waggons are drawn up alongside the stack, and the load is forked on to the stack.

What has been described is the most general method of building a stack, but on large farms there are several labour-saving implements that are brought into use.

There is the elevator, which carries up the hay in a stream on to the stack, and is kept in motion by a horse; also the horse-fork, by which large masses of hay are held and raised above the stack by means of horse-power, and then by the pulling of a rope the forks loosen their grip and the hay falls on to the stack.

When hay, which is not in proper condition, is stacked, heat is set up which, if allowed to continue, blackens the hay, and has been known to burst out into flame when at last exposed to the oxygen in the outer air. Layers of straw are sometimes put in a haystack to prevent this heating by soaking up the natural juices which are too abundant in the hay. The straw then becomes almost as good fodder as the hay.

When the haystack has had time to settle down, the long hay sticking out from the sides is pulled. This gives the stack a tidy, compact appearance. When it is thatched and roped it may be said to be finished and secure.

PLATE XXXVIII

DIFFERENT METHODS OF HARVESTING

1. MAN WITH SICKLE

Plates XXXVIII, XXXIX, and XL show at a glance the different methods that have been used in cutting grain from the earliest time to the present day.

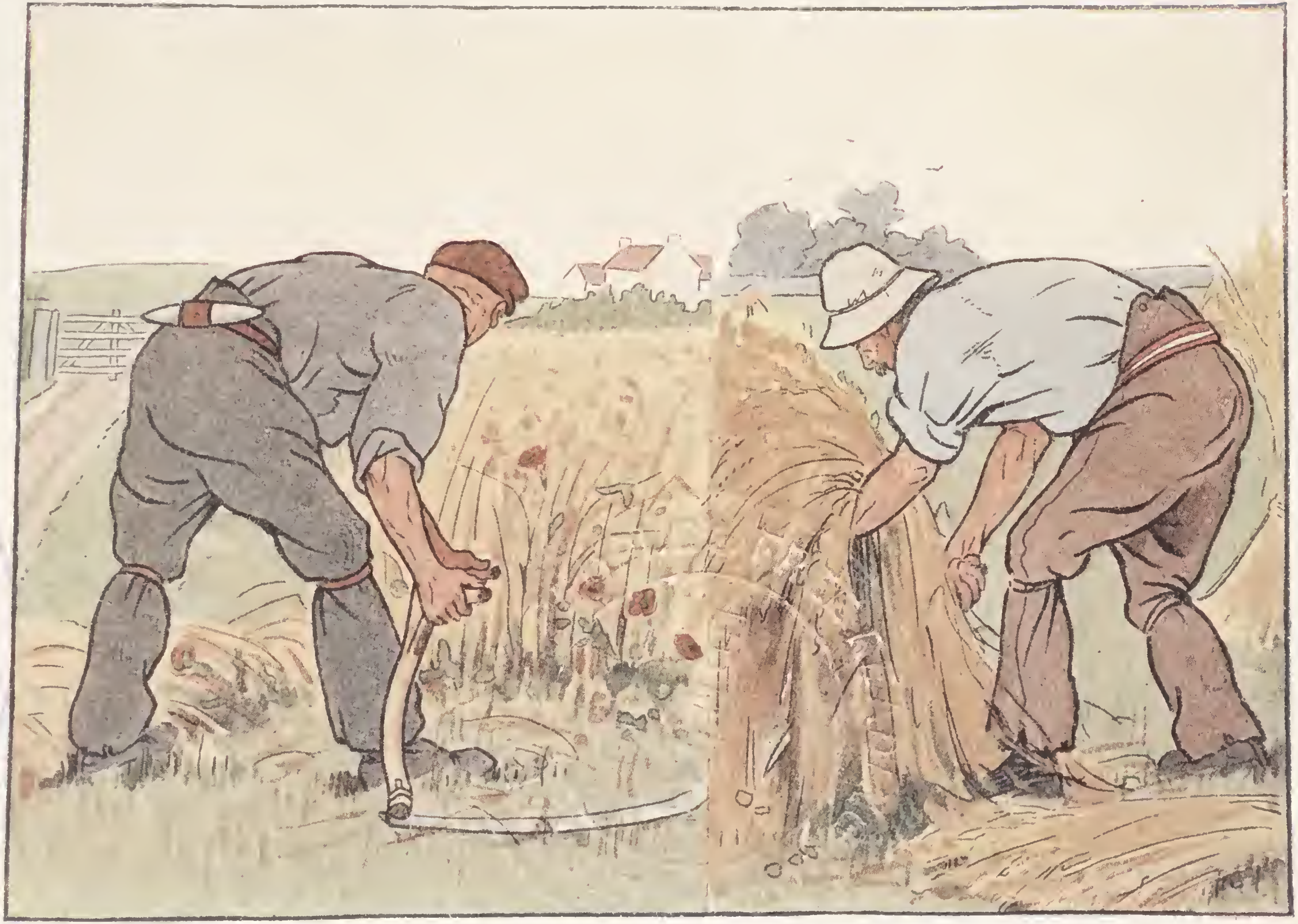
The sickle or hook, were we to seek its origin, would take us very far back in the history of the world. Now it is only used to cut down nettles or thistles, and clear the rank growth of ditch sides.

In the days of reaping with the sickle more workers were employed than at the present time. But labour was cheaper then and more plentiful, and food simpler, and people had fewer needs than they have to-day. Reapers were paid by the number of shocks, or stooks, of grain they cut. The sheaves were measured by a two-pronged measure, one foot long and one foot wide, which was slipped over each sheaf where it was bound.

2. MAN WITH SCYTHE

The origin of the scythe springs without doubt from the sickle. Indeed an early form which came from Flanders was used with one hand only, and was much in favour for cutting grain that had been broken down by the wind. The scythe, as we know it, is a long curved blade fixed at a proper angle to a handle, which is usually curved

PLATE XXXVIII



DIFFERENT METHODS OF HARVESTING

Man with Scythe

Man with Sickle

but sometimes straight, and which has two smaller handles projecting from it by which the tool is caught.

Mowing with the scythe is work which must be learnt. Each mower has his scythe blade set and his handle fixed to suit himself. Even the sharpening of the blade can only be done with satisfaction by the man who is using the scythe.

When the grain harvest was reaped with scythes, the mowers, as a rule, went in bands, or "heads," as they were called. Each head consisted of two or three mowers, two or three gatherers, two or three bandsters, who made the bands for tying the sheaves, and one raker who raked the loose straws.

At the present day the scythe is still a useful tool on the farm. Meadow hay is usually cut with it, but in the harvest-field it is only used to open up roads, round the grain for the reaper and the self-binder, or to cut out lying and tangled grain.

PLATE XXXIX

REAPING-MACHINE

It is of interest to note that the inventor of the first useful reaping-machine was the Rev. Patrick Bell, a Forfarshire minister. This machine was pushed by a pair of horses, and cut the grain by means of a series of clipping shears.

The reaper of the present day, as you see from the picture, is drawn by two horses. The cutting is done by the swift movement to and fro of a flat, narrow iron bar armed with sharp, saw-like teeth.

When the stalks of grain are cut they fall on to what is called the tilting-board, which you can see a part of in the picture. Then the man sitting on the reaper with a rake in his hand pushes off what has gathered, so that it slips on to the ground ready for the "lifters," which is the name given to the workers that lift and bind the sheaves. They are tied with bands made by taking a handful of grain stalks, dividing it into two parts, then laying the grain ends of the straw across each other and twisting them round, so that the ears lie above the twist. The band is stretched on the ground to receive the sheaf, which is bound rather nearer the head than the bottom.

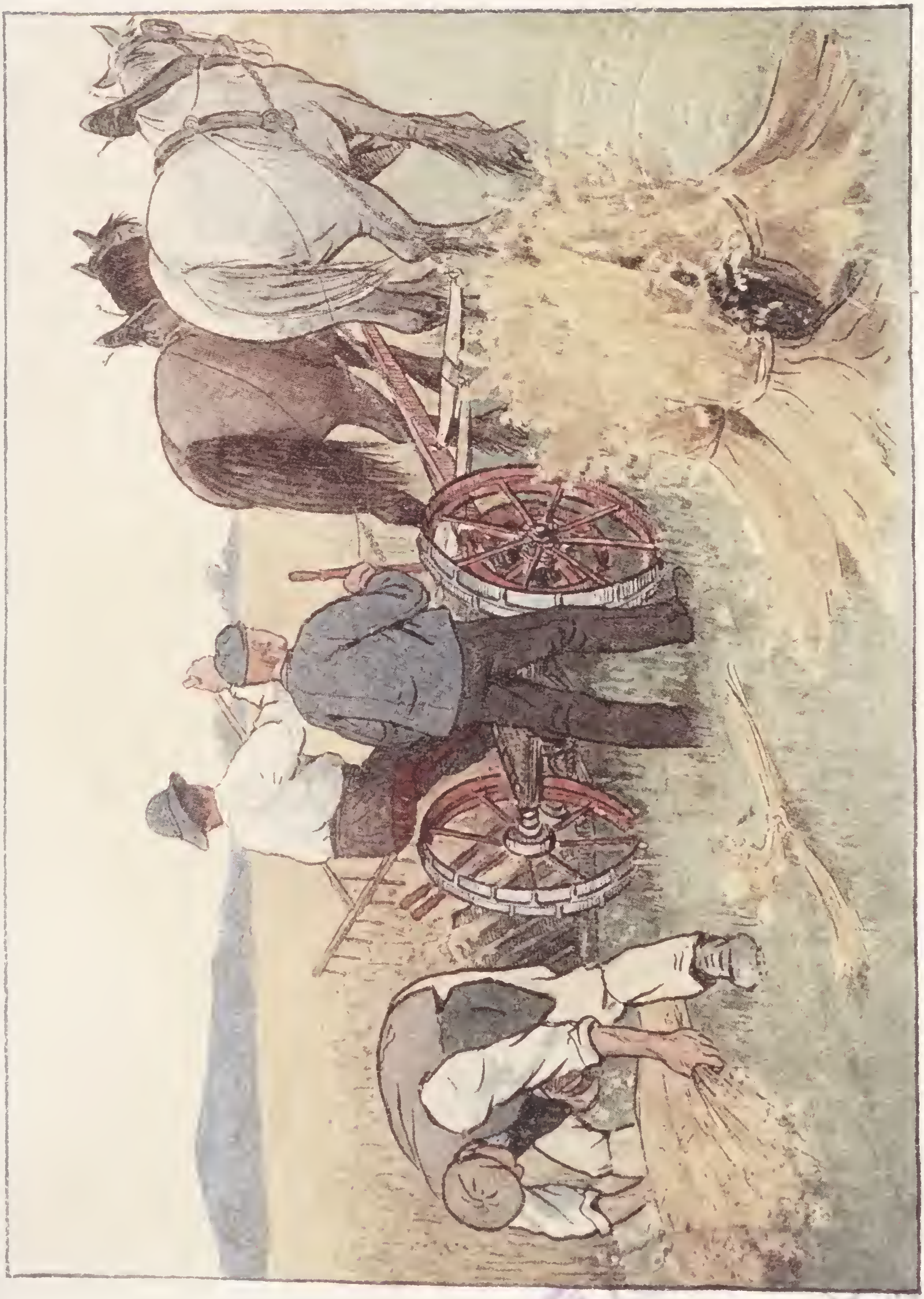
To enable the grain to dry, the sheaves are set up in groups of pairs called shocks or stooks. Six or eight sheaves are, as a rule, put in a stook. These are kept in rows ready for carting.

PLATE XL

SELF-BINDER AT WORK

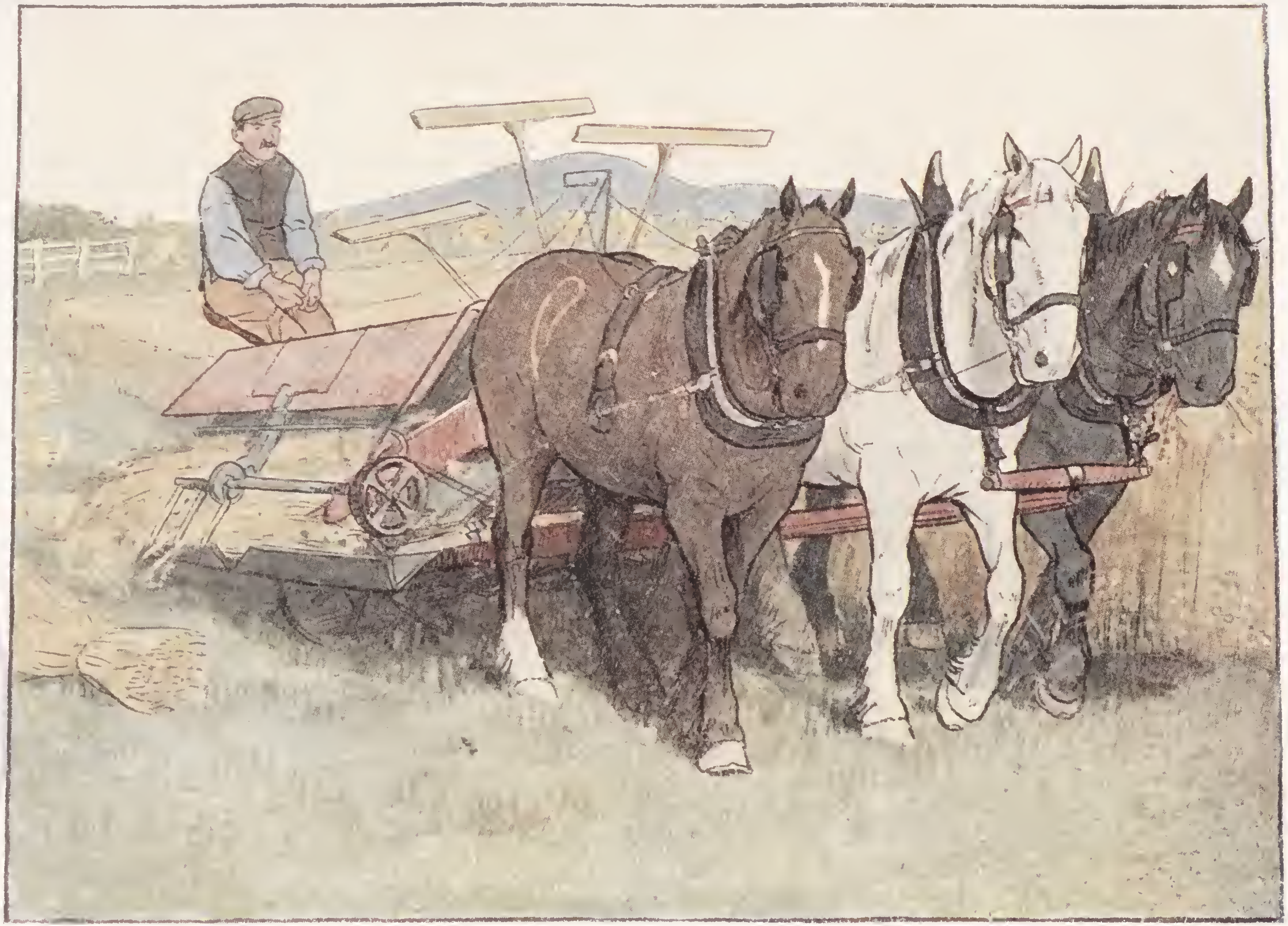
On no farm implement has so much brain power been spent as on this machine. It is impossible here to tell you all about it. If you were follow-

PLATE XXXIX



REAPING MACHINE

BOMBAY.



SELF-BINDER AT WORK

BOMBAY

ing one while doing its work in the field you would be surprised to see how quickly and well it was done. The horses draw it along, and at the distance of every few steps the grain-crop which is being cut drops from the machine as sheaves, each tied with a piece of strong string. These sheaves, which are lying on the ground in rows, are then set up to dry.

PLATE XLI

BUILDING CORNSTACKS

Before the grain can be stored in stack or barn it must be quite dry, not merely of moisture but of the natural sap in the straw. To find out if this is so, the farmer slips his hand down into the middle of a sheaf here and there throughout the field. If the straw where the band holds the sheaf feels damp and raw, then it is not ready, but if the sheaf has a general feeling of lightness and crispness or is, as it is termed, "in rattling order," then the farmer can say—

> "Come, saddle the horses and call up the men."

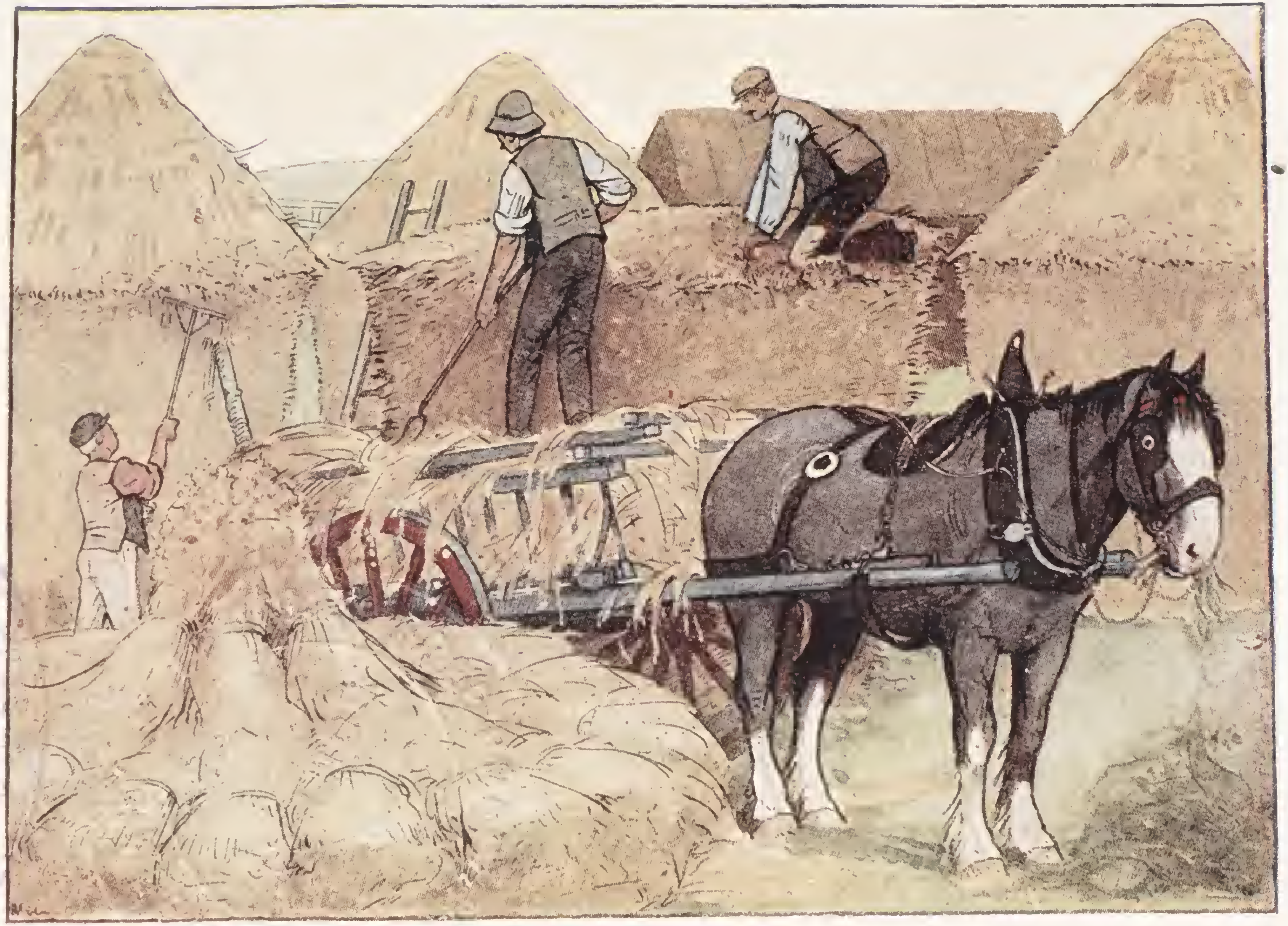
In the picture you see stacks in different stages of building. In the foreground on the left is a stack just begun. The builder first beds the stack bottom with straw. He then stands in the centre and receives the sheaves as they are forked from the cart and sets them on their ends or butts in a circle. Bit by bit he widens out the circle, and at the same time lessens the slope at which he lays the sheaves, till the first row is laid, with the butts in line with the outer edge of the stack bottom. The builder then kneels as you see in the picture. As he lays a sheaf in position he kneels on it and goes round with the sun. You may have noticed that the butt of a sheaf is slanted. If you watch you will see that the builder puts the point of the slope downwards.

When he comes to where he began he commences a new row farther in, placing the butts at the bands of the first row of sheaves. Then he works in to the centre. A new outer row is then begun, and by repeating this process the stack mounts upwards.

The important point in building a stack is to keep the centre slightly higher than the outer edge. This is termed "keeping the heart full." If this is not done, then when the stack has settled down, the sheaves will slope inwards and provide a channel for the rain. Thus it may be said of stack-building that—

> "The heart ay's the part ay
> That makes us right or wrang."

The head of the stack begins at what is called the eave. By making the circle of sheaves less



BUILDING CORN STACKS

BOMBAY

and keeping the heart full, the head is brought at last to a point, the top sheaves being tied to one another. Every farmer, however, has his own way of heading the stacks.

As the stack goes up, the builder, or a man whose duty it is to guide the builder, has to place supports, or stack props, as they are called, round the stack.

When the last cart has entered the stack-yard, there is a sigh of relief from master and man. Every one goes to rest—

> "All with weary task foredone."

PEOPLE'S [illegible] LIBRARY
BOMBAY.

PLATE XLII

THATCHING STACKS

A well-built head on a stack is in itself a safeguard from rain for a time, but the grain is not secure till the stack is thatched and roped. This is the last stage of harvesting.

Both wheat and oat straw are used for thatching, and in some districts rushes.

Starting at the eave and working by stages up to the top of the stack, the thatch, by overlapping, makes a complete cover. The thatcher, as he proceeds, strokes the straw down with a light stick. A little dampness in the air, or water flung on to the thatch, makes the straw lie better.

As soon as a stack is thatched, it is roped. A coarse kind of rope called coir-yarn or sometimes straw ropes are used.

The eave or waist-rope is put round the stack below the eaves. To this, the ropes that hold down the thatch are tied at both ends. In roping, as in everything, there are forms and fashions, but what I have told you is common to all.

The harvest may be said to be over when the stacks have been trimmed with shears and scythe, and the rakings have been gathered to join those that have come in from the fields. Then the stack-yard is left deserted, except for the poultry that wrangle over the fallen grain.

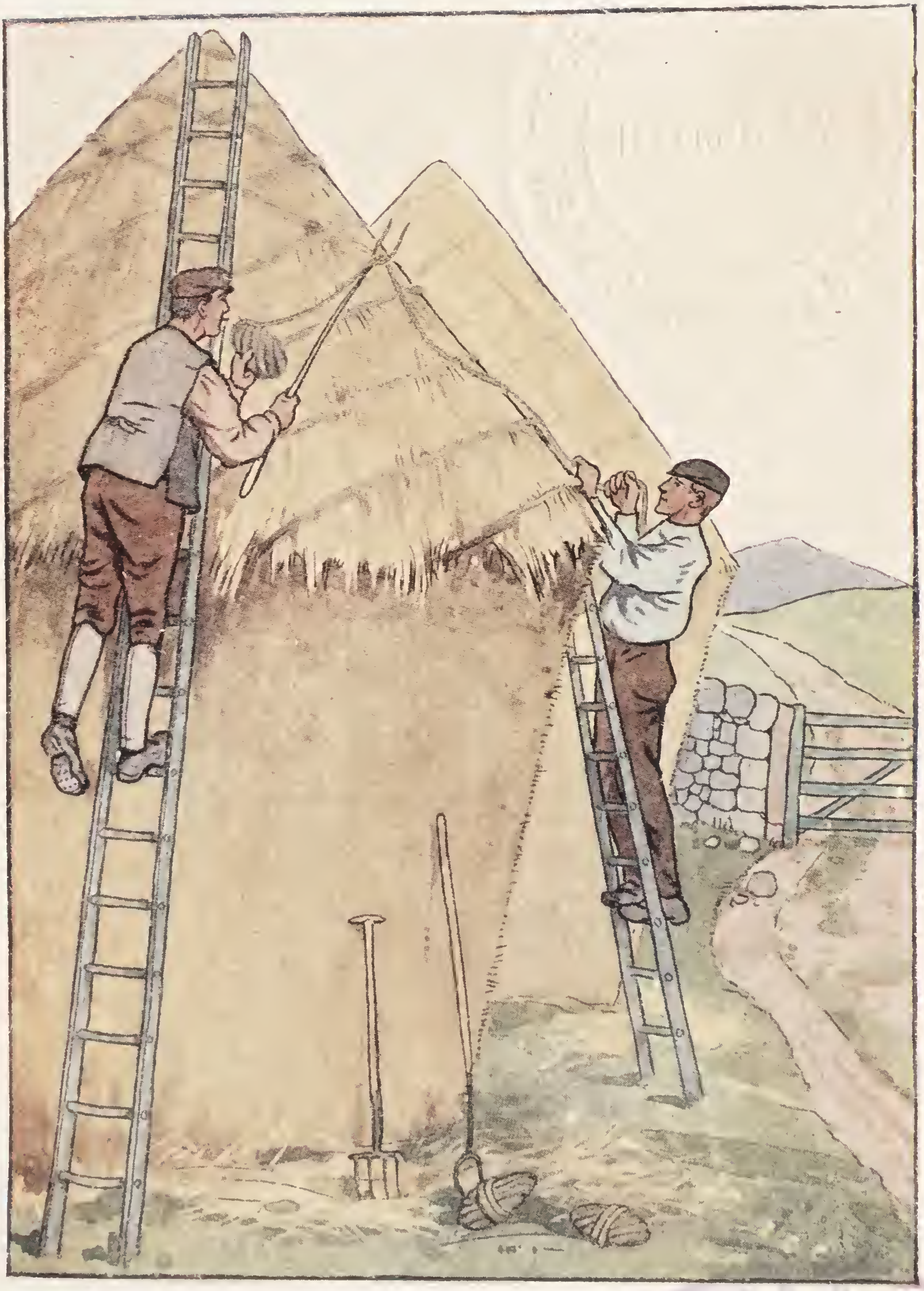
I cannot close this harvest sketch without inviting you to what used to be a common custom, which now but few observe—

> "The long-accustom'd feast of Harvest Home."

You are invited—

> "For all that clear'd the crop, or till'd the ground,
> Are guests by right of custom—old and young."

When the feast is over and the floor has been cleared, let us slip away and leave the company to dance and merriment, which tell of thankful hearts.



THATCHING STACKS

BOMBAY.

PLATE XLIII

THRESHING-MILL

You have seen the farmer sowing and reaping his grain. Now, in this picture, the grain is being taken from the straw; that is, it is being threshed.

The man on the stack is forking the sheaves to the women on the mill, who are cutting the bands of straw or string, and handing the sheaves to the man who is feeding the mill. On the sheaves being put into the mill they are struck by a drum which whizzes round at a great speed. This causes the grain to fall out of the ears. The grain is then carried along inside the mill. As it goes it is divided into first, second, and third quality, each falling into separate sacks.

The man standing at the end of the mill is watching the sacks that are being filled with grain. He shuts off the supply when a sack is full and then runs it into another empty sack.

From the other end the straw comes tumbling down, either loose or, if the mill has a "buncher," in big bunches tied with string. The chaff is thrown out from the side of the mill into other sacks. Sometimes the ploughmen's wives come and fill their beds with the fresh, clean chaff.

A threshing-mill, like the one in the picture, is owned, as a rule, by a grain-merchant, who sends it on hire from farm to farm. The presence of one in a district is easily told by the deep booming sound that it makes. The mill is driven by means of a steam-engine.

PLATE XLIV

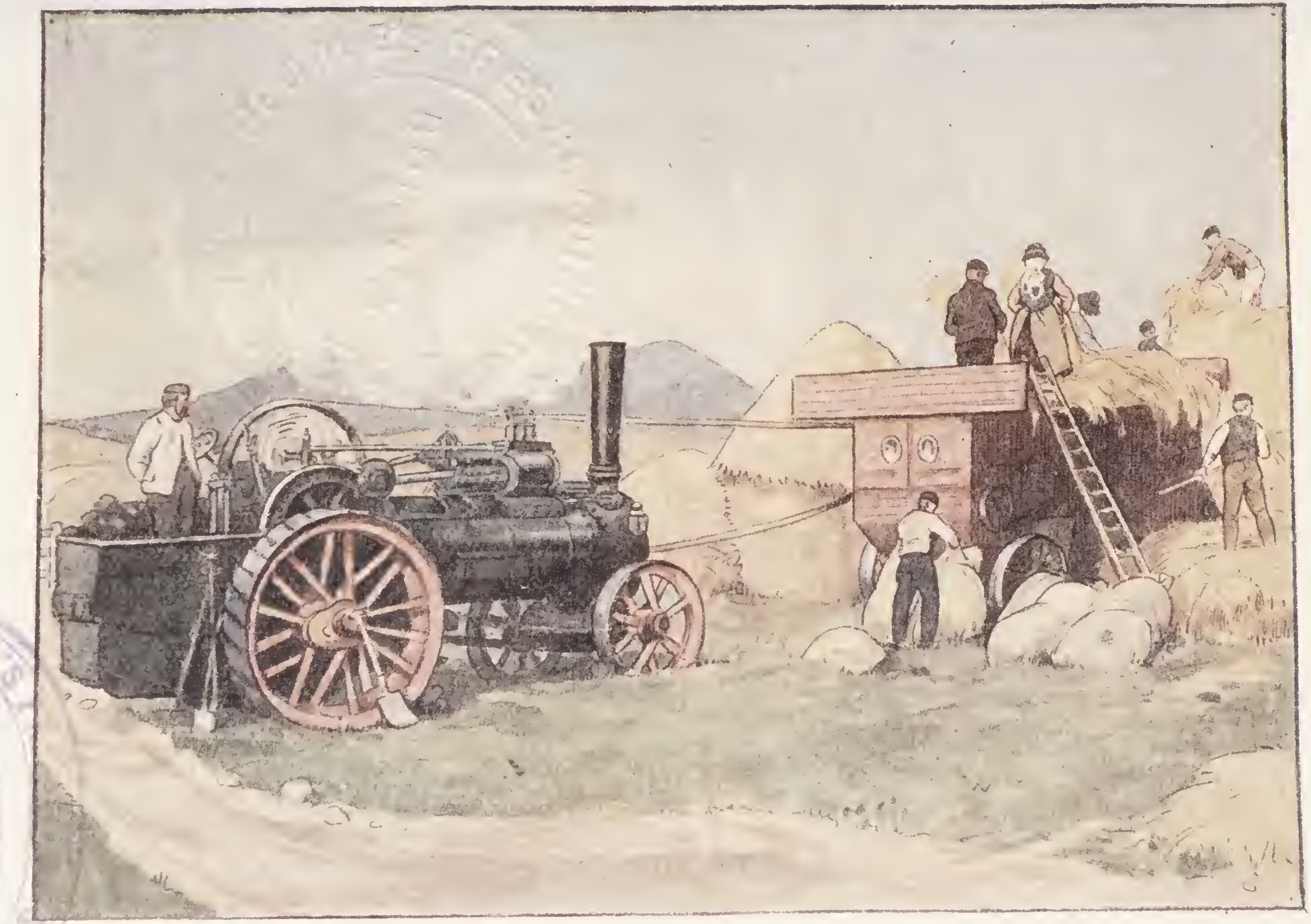
ENEMIES OF THE FARMER

Now, before we go any further in our talks about the farm, I want you to look at the next four pictures. They show some of the farmer's enemies. You will say at once, I am sure, "How many there are!" But even these do not show them all. Let us see in what way they are the farmer's enemies.

1. FOX

From the way in which the fox is stealing across the field in the picture you can tell at once that he is a cunning and crafty creature. Ever on the watch for a meal, he is ready to pounce on any member of the poultry yard. He will even seize a young lamb and carry it off to his den under cover of night. He makes fine sport for huntsmen, who chase him with

PLATE XLIII



THRESHING MILL

BOMBAY.

hounds, with horn, and loud "Tally ho!" His tail, or brush, is highly prized.

2. RABBIT

Poor little Bunny looks quite harmless as he hops about the fields showing his little white tail at every hop. Where there are, however, many of them, rabbits do a great deal of damage by eating the farmer's grass, grain, and root-crops. The animals on the farm do not care to feed on the grass which is overrun by rabbits.

3. RAT

No one likes the rat. Its look makes you shudder. The farmer cannot say anything good about it. It eats the grain in the stack and in the barn. It kills chickens, and is very fond of young ducks. With its sharp teeth it gnaws holes in the farmer's sacks, it eats its way through wood, and sometimes, even, through lead piping. Worse than all this, it is the means of carrying a dreaded Eastern plague. No wonder, then, that the farmer does all he can to rid himself of this pest.

When summer comes the rat leaves the farm barns and sheds and makes its home in the ditches and fields.

4. MOUSE

Though the mouse does a great deal of harm by eating the grain, and nibbling through sacks to get at it, the "wee timorous beastie," as Burns calls it, is not so much disliked as its cousin the rat. It is very quick in its movements. I have seen a mouse jump from the top of a stack twelve feet high and run off unhurt the moment it reached the ground. Think what that meant to a creature of such a small size. Mice and rats do not agree to live together. If the rats have taken up their abode in the head of a stack, the mice will be found in the middle or at the bottom.

5. VOLE

Mr. Vole is a plump little fellow with a short tail. He lives in the fields, eats grass, and nibbles the bark and roots of young trees. Voles are not very harmful to the farmer except in places where they become too numerous. There was a plague of voles in Scotland some years ago. The cause of their great numbers was due, so it was said, to the fact that hawks and owls, which prey on the vole, had been shot down.

PLATE XLV

ENEMIES OF THE FARMER (*continued*)

1. MOLE

The mole does not show himself very often above ground. It is in the mole-catcher's trap that one can best get a close look at him.

The sharp nose and strong, broad fore-paws show how the mole is fitted for burrowing in the earth. You cannot see his ears, nor is he blind, as you might suppose. For ears he has two tiny holes, one on each side of his head, and his eyes are hidden by his short, soft fur.

You may have seen mounds of fresh earth here and there in the fields and meadows. They have been thrown up by the mole when making the underground passages of his home. It is this that makes the farmer look on the mole as his enemy. The mole, however, does a little good by eating insects and grubs.

2. PIGEON

I would not be at all surprised if you had a warm corner in your heart for the wood-pigeon. Yet, among birds, the farmer has no greater enemy. It feeds on all the different kinds of grain-crops, and does a great deal of harm to the young plants, such as clover and cabbage, in spring. The pigeon is a timid bird, and is easily scared away; for that reason it is not easy to shoot.

3. ROOK

The rook is a great thief, though he is rather a handsome bird. If you will look at Plate XXI you will see that a number of rooks are following the plough. They are picking up worms and grubs. In this they are doing the farmer a good turn. But now look at Plate XXIII. Here they are doing the farmer harm, for they are picking up many of the grains of the seed which he is sowing. Later in the season the rooks will pay a visit to the turnip-field just when the young plants are coming up. At the roots there may be wire-worms (Plate XLVI). These, rooks are very fond of, and, to get them, they will pull up the young plants till not one of them is left. So quick and clever are they at doing this that a small band will cause much loss in half-an-hour. When you think of the cost of the seed and the labour that has been spent on the field, can you wonder that the farmer tries to get rid of these raiders? Of course, the rooks' excuse is that they want to get at the wire-worms, but the loss of crops by wire-worms would not be so great as that caused by a visit from the rooks. They are also very fond of new potatoes, and will peck their way through the soil to get at them.

4. SPARROW

In America this little bird is known as the saucy British sparrow, and right well does he deserve the name. He seems to be afraid of no one, but goes just where he pleases. When the farmer's corn fields are beginning to ripen, large flocks of sparrows alight on the heads of grain that grow close to the hedgerows, and in a short time they leave only empty ears of corn.

5. BLACK-BACKED GULL

The black-backed gull is well known to fishermen as a thief. In late years he has come inland. He is said to steal fish from the streams, and has been known to carry off chickens and attack young lambs.

PLATE XLVI

ENEMIES OF THE FARMER (*continued*)

1. WIRE-WORM

The life-history of an insect differs from that of an animal. The animal simply grows till it has reached its full size, but the insect passes through different forms so unlike each other that you could not tell, unless from long study, that there was any relation between the several stages. First there is the egg, then the larva, which, of different insects, is called the grub, the caterpillar, and the maggot. The third stage is the pupa, or chrysalis, and, lastly, there is the perfect insect.

You will understand now when I tell you that the wire-worm is the larva, or caterpillar stage, of a beetle called the Click Beetle or Skip Jack (2).

The wire-worm is the most harmful of all the insect pests of the farm. There is hardly any crop that is not open to its attack. When the blades of young corn look drooping and blighted, when the newly singled turnips droop and die, the farmer knows his enemy is at work. If he pulls up a young plant he may find one boring its way through the root. The wire-worm is hardly an inch long, and reddish-yellow in colour.

You will do the farmer a good turn if you kill it, but it is a tough customer, for it is very hard. That is why it is called the wire-worm.

Unfortunately for the farmer, the wire-worm remains a wire-worm for fully three years before it becomes a click beetle.

2. CLICK BEETLE

This beetle gets its name because of the sound it makes when it jumps, or when it is held by one end. It is also called Skip Jack, because when put on its back it throws itself into the air and lands on its feet.

3. TURNIP-FLY

When you see a farmer walking up the turnip drills, and bending as he goes, do not suppose he has lost anything. Alas! he has found something, found his enemy the turnip-fly busy eating the young smooth-leaved plants. It has been a dry time, and as he bends he sees very small black objects jumping here and there. If he looks more closely he finds that the turnip-fly, or small flea beetle, has a broad yellow stripe down the cover of each wing. It eats the first young leaf of the turnip, and will, when numerous, and if the weather be favourable, kill out the entire sowing. The turnip-fly uses its strong wings for flying in search of food, which it is said to be able to scent. As the turnip-fly during winter and early spring lives on charlock and wild mustard, care should be taken to destroy such weeds.

4. DADDY LONGLEGS

The daddy longlegs, or crane fly, is that flimsy, loose-jointed fly with spindly legs that sprawls over your face just as you are wishing to enjoy a snooze on a hot July afternoon. It is in the farmer's black books because from its eggs come most harmful grubs, commonly called "leather jackets," owing to the toughness of their skins. These grubs attack all kinds of grain, and most of the farm crops and garden plants. They can ruin a crop of grass entirely by injuring the grass roots.

The grub has a black head armed with strong jaws for biting. The body is brown, or brown shaded with dark green, and has two light-coloured lines down the back.

5. CLEG

Cleg is a general name for several varieties of the summer flies which are most tormenting to horses and cattle. They pierce the skin with a set of lancets hidden in the mouth and then suck the blood.

The one shown in the picture is the small greyish-coloured fly, but there are other members of the family which are larger.

PLATE XLVII

ENEMIES OF THE FARMER (*continued*)

1. SHEEP CADE

The sheep cade is one of those creatures that I told you of when giving the reasons why sheep were dipped. In appearance it is not unlike a rusty brown coloured spider. It lives in the sheep's wool.

2. WARBLE FLY

When you see cattle on a summer's day suddenly raise their tails in the air and rush madly hither and thither, the cause most likely is the presence of a warble fly.

It resembles a bee in size. When it alights on the cattle it causes them great discomfort.

Those who tan the hides of cattle say that the holes made by the warbles greatly lessen the value of the hide.

3. SHEEP MAGGOT FLY

The sheep maggot fly is the most dreaded pest of the sheep.

It resembles the bluebottle fly, but is much

OPLE'S FREE R. R. & LIBRA
BOMBAY.

smaller, and attracts the eye by the shimmer of its bluish-green body.

From the middle of June to the end of August a most careful watch has to be kept against its attacks, especially in warm moist weather. It alights on the sheep and causes them great pain.

Those who tend sheep can tell when one is "struck," as it is termed. It withdraws from the rest of the sheep, becomes very restless, shakes its tail, or tries to bite the part affected.

Another ailment, called "sturdy," common to sheep affects the brain so that the animal, instead of walking straight forward, goes round in circles.

Much more might be said about these various ailments, but all you need know of them at present is that they exist. Pray do not go away with the idea that an animal's life is free from pain and worry.

PLATE XLVIII

FRIENDS OF THE FARMER

Let us now talk about some of the farmer's friends.

I. CAT

A cat is very useful on a farm, for, without its aid, the farmer could do but little in keeping down the numbers of mice and rats. He ought to feel grateful to it as it follows him about from rick to barn, and from barn to stable. Sometimes it catches rabbits and birds. Although it does find food for itself, it should always be given some new milk as well to keep it healthy.

2. STARLING

The starling may be said to share the farmer's home, for very often it builds its nest in the chimney or under the eaves of the roof. A starling lives on worms, and snails, and most of the grubs that do harm to the crops. You may often see a starling lighting on the back of a sheep. It is searching for cades among the wool. In the early part of summer little flocks of starlings may be seen pecking here and there in the grass close to where the cattle are grazing. They are eating, it is thought, the warbles which are shaken off the backs of the animals. They also dig up the leather-jackets from the roots of the grass.

3. LAPWING

In spring you may often hear the cry "Pee-wit, pee-wit," as you walk in the fields. It is the cry of the lapwing sweeping in half circles above its nest. If you look for the nest you may not find it, for it very often consists only of a few dried pieces of grass, in a ploughed field. The lapwing is one of the best friends the farmer has, for it lives on snails, wire-worms, beetles, and grubs.

4. OWL

When darkness has come over the farm, and master and man are taking their rest from toil—

> "The clamorous owl that nightly hoots Tu-whit, tu-who,"

awakes from its day slumber, and with noiseless flight seeks food by hedgerow, stack-yard, and barn. It feeds on mice, insects, and small birds.

5. LADYBIRD

The ladybird is the old friend of the nursery rhyme. Beneath the brightly coloured casing its wings are closely tucked and hidden.

It is in the larva stage of its life that the ladybird helps the farmer by eating the many kinds of insects that are to be found on plants. The green-fly on the rose-bush and other plants are its favourite food.

6. WORM

A whole book has been written on the worm, though it is not at all an attractive creature. Unless it exists in too great numbers in the soil, it does a great deal of good, and may therefore be counted as one of the farmer's friends. In a most clever way it freshens the soil and gives to it just the substances that form plant food. It stirs up the soil, bringing that which was underneath to the top, and taking that from the top down below. It is therefore a kind of ploughman or gardener. Do not then despise it, but, as you close this book, remember that by living its life it has done more than any other creature to make the world what it is; do not tread it beneath your foot, but rather find in its slender form an example of how useful small things can be.

Pd
16

PEOPLE'S FREE R. R. & LIBRARY
BOMBAY.

1832

PEOPLE'S FREE R. R. & LIBRARY
BOMBAY.

PRINTED IN GREAT BRITAIN

FREE READING ROOM & LIBRARY
BOMBAY

[illegible]

BOMBAY.

BLOSSOM
Ph. : 25320400
₹ 250